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ABSTRACT

This paper, third in a series of five reports on results of a national study of American attitudes, knowledge, and behaviors toward wildlife and natural habitats, focuses on the American public's attitudes, perceptions, and understanding of animals. Data were derived from questionnaires administered to 3,107 randomly selected Americans (18 years and older) and random samples of members of the National Trappers, National Cattlemen's and American Sheep Producers Associations. Results are reported and discussed around three topic areas: (1) knowledge of animals (overall and by selected knowledge categories, among major demographic groups, awareness of wildlife management issues); (2) species preference (most liked/disliked, preference for types of animals, in relation to critical wildlife issues, among major demographic groups); and (3) basic attitudes toward animals, considering prevalence in the entire American public and among major demographic groups (including age, sex, race, education, income, urban/rural residence, occupation, attendance at religious services, and marital status). Attitude scale methodology, national survey completion rates, comparison of demographic characteristics of national sample with United States census data, frequency distribution of preferences for 33 animals, and attitude scale mean scores by selected animal-related activity groups are provided in appendices. (JN)

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PHASE III:

KNOWLEDGE, AFFECTION AND BASIC ATTITUDES TOWARD ANIMALS IN AMERICAN SOCIETY

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INTRODUCTION

This paper is the third of five reports on the results of a national study of American attitudes, knowledge and behaviors toward wildlife and natural habitats. The first paper focused on public perceptions of critical wildlife issues including endangered species, animal damage control, habitat preservation, consumptive use, funding of wildlife management, law enforcement, urban wildlife, backcountry use and parks, and others.* The second report reviewed data on activities of the American public relating to animals including consumptive, non-consumptive and vicarious wildlife as well as domestic animal-related uses.** Among the topics covered in the Phase II report were the size, social characteristics, attitudes, and knowledge of these diverse groups. The fourth report will focus on children's attitudes, knowledge and behavior toward wildlife and natural habitats. The fifth and final report will examine historical trends in wildlife use and perceptions during the 20th century.

The subject of this paper -- the third report in the series -- is the American public's fundamental attitudes, perceptions and understandings of animals. This presentation will largely be built around three topics, as summarized in Table 1. The first will consider factual knowledge of animals, in addition to relative awareness of selected wildlife management issues. In this regard, the views of the American public as a whole, as well as those of diverse demographic and animal-related activity groups, will be examined. The second topic will cover preference for and perceptions of various animal species. Finally, the remainder of the paper will consider basic attitudes toward animals in contemporary American society. In addition to the entire American public, the demographic variables examined will include age, sex, race, education, income, regional residence, urban/rural distinctions, property ownership, attendance at religious services, occupation and, to a limited extent, marital status.

A thorough methodological review will constitute the subject of a separate report. The following description, however, should provide information sufficient to understand the basic techniques and methods employed in this study.

The data was derived largely from a national survey of 3,107 randomly selected Americans in the 48 contiguous states and Alaska. In addition, mail sur-

*"Public Attitudes Toward Critical Wildlife and Natural Habitat Issues", National Technical Information Service #PB-80-138332, $10.00 per copy.
**"Activities of the American Public Relating to Animals", National Technical Information Service #PB-80-194-525, $12.00 per copy.

TABLE 1

FOCUS AREAS OF THE PHASE III REPORT:

1. KNOWLEDGE OF ANIMALS
   - A. OVERALL AND BY SELECTED KNOWLEDGE CATEGORIES
   - B. AMONG MAJOR DEMOGRAPHIC GROUPS
   - C. AWARENESS OF WILDLIFE MANAGEMENT ISSUES

2. SPECIES PREFERENCE
   - A. MOST LIKED AND DISLIKED
   - B. PREFERENCE FOR TYPES OF ANIMALS
   - C. IN RELATION TO CRITICAL WILDLIFE ISSUES
   - D. AMONG MAJOR DEMOGRAPHIC GROUPS

3. BASIC ATTITUDES TOWARD ANIMALS
   - A. PREVALENCE IN THE ENTIRE AMERICAN PUBLIC
   - B. AMONG MAJOR DEMOGRAPHIC GROUPS:
     AGE, SEX, RACE, EDUCATION, INCOME, URBAN/RURAL RESIDENCE, PROPERTY OWNERSHIP, REGION, OCCUPATION, ATTENDANCE AT RELIGIOUS SERVICES, MARITAL STATUS

veys were conducted with random samples of members of the National Trappers, National Cattlemen's and American Sheep Producers Associations.

Various stages were involved in the construction of the national survey. The identification of reserach priorities was based on an extensive literature search, and consultation with representatives of over 50 federal, state and private wildlife management agencies and conservation organizations. Following this review process, critical issues and research priorities were identified based on an assessment of their potential relevance to the study's goals and objectives, recognizing that insufficient time and resources limited the capability to cover all subjects of concern to wildlife managers and professionals. The survey construction process then followed, during which over 1,500 attitude, knowledge and behavior questions were developed and reviewed. Particularly important in this evaluation process were five to seven pretests conducted for each questionnaire section. A variety of question types were included -- closed and open-ended response formats, simple statements, more elaborate scenario-type questions, and Likert scales with five to nine response alternatives.* The survey was divided into five sections: attitudes (both basic attitudes toward animals and feelings about specific issues), knowledge of wildlife, animal-related activities and behavior, parent and grandparent experiences with wildlife, and social demographic characteristics. For the most part, the exact wording of the animal-related activity and attitude questions covered in this paper are included in the result tables.

On attitude questions involving the protection of wildlife and their natural habitats, trade-offs involving various kinds of socioeconomic impact and sacrifice were, whenever possible, included. In addition, questions were omitted if any of the following flaws were substantially present: too general, double negatives, two-part questions, too esoteric, difficult wording, questionable intelligibility to the least educated person, or too idealized or simplistic.

Attitude scales were developed based on a typology of nine basic attitudes toward wildlife and the natural world. Definitions of these attitudes will be indicated later in the paper. Cluster and other correlational analyses were employed in the construction of scales (based on a battery of questions) to measure

*For those unfamiliar with these terms: closed-ended refers to questions with a fixed set of response alternatives; open-ended questions allow the respondent to provide any answer; Likert scales involve an ordinal range of answers from degrees of positive (e.g., strongly, slightly) to negative response.

these attitudes. Sixty-nine attitude questions were used with the smallest scale (the humanistic) consisting of five items while the largest (the utilitarian) included thirteen questions. Whenever appropriate, the strength of the response (e.g., strongly versus slightly agree/disagree) was included. Scale scores ranged from 0 to 11 for the humanistic scale, to 0 to 27 for the utilitarian. Useful scales were devised to measure the presence and strength of all the attitudes with the exception of one -- the aesthetic attitude -- for which no adequate scale was developed. The independence of the other eight attitude scales was partially indicated by relatively small scale intercorrelations -- 14 under .20; the smallest, .04; the largest negative correlation, -.42; and the largest positive correlation, .40. (Additional scale construction information is provided in Appendix I.)

An animal knowledge scale was also developed, based on 33 true/false and multiple choice questions. Over 500 questions were considered in developing this scale, and five pretests were conducted. Questions covered all six vertebrate animal classes, and five questions dealt with invertebrates. Additionally, all questions were omitted which might favor specialized knowledge on the part of any animal activity group. The distribution of scores on the knowledge scale was roughly normal, with a mean of 52.8 on a range of scores from 0 to 100.

Because many issues covered in this study are of special significance to contemporary wildlife management and some findings of a potentially controversial nature, it seemed advisable, within reasonable cost limits, to select as representative a sample as possible of the American population. Thus, it was decided to choose a probability random sample, ensuring that every individual in the population had a roughly equal chance of being included in the study. This sampling procedure involved a seven-stage selection process in which a specified individual within a particular household was identified as a potential respondent, with the interviewer having no discretionary role at all in choosing the respondent. In addition, a minimum of four attempts to interview the specified respondent -- an initial contact plus three "callbacks" -- were required before the potential respondent could be dropped for consideration in the study. This procedure enhanced the randomness of the sample selection since people have differential likelihoods of being at home (e.g., younger persons, outdoor recreationists and working males are less likely to be at home than elderly persons, the physically handicapped or housewives). Additionally, callbacks were conducted at different hours of the day, different days of the week and on weekends to increase the probability of inter-

viewing the designated respondent.*

Although personal interviews are more labor intensive and, thus, costly, this interviewing procedure was selected over mail or telephone techniques to enhance the quality of the data collected. The interview generally required sixty or more minutes to complete, and possible distortion resulting from the interview's length was reduced by placing all attitude and knowledge questions at the beginning of the survey, and concluding with only specific behavior and demographic questions.

The total national sample size was 3,107 and included respondents only 18 years and older. An oversampling of both Alaska and the Rocky Mountain states was conducted to ensure sufficient numbers in these critically important areas. Respondents from these regions were assigned weights to take into account this oversampling in all analyses referring to the entire American public. This weighting reduced the national sample size to 2,455. Interviews in the contiguous states were conducted by Marketing Information Services of Atlanta, Georgia, and in Alaska, by Market Opinion Research of Detroit, Michigan. Fifteen survey research firms were considered for this work, with the basis for selection including cost estimates, prior experience, proposals submitted, and recommendations received from previous contractors.

Even with a sample size of 3,107 people, it was recognized that certain important groups would not be adequately represented due to their relatively small sizes in the American population. In an effort to compensate for this deficiency, special arrangements were made with the National Cattlemen's, American Sheep Producers' and National Trappers' Associations to mail copies of the national questionnaire to random samples of their membership. These mail surveys were accompanied by letters, co-signed by the principal investigator and key leaders of the representative organizations, indicating the purposes of the study and its potential relevance to wildlife management. The membership sample sizes were 125 for the National Cattlemen's Association; 136, American Sheep Producers Association; and, 172, National Trappers Association. Along with the national survey, members of these organizations were asked 12 additional questions pertaining to issues of special significance for their membership.

Response rates for the entire national sample, for each region, and by number of interview attempts are indicated in Appendix 2. Some 22% of those contact-

*The national survey was conducted during the months, September-October, 1978.

ed refused to be interviewed, an additional 13% could not be located after the fourth interview attempt, and approximately 4% terminated the interview before its completion. The Northeast and Western states had the highest combined refusal and not-at-home rates, whereas the fewest occurred in a special Western oversample and in the South. Additional callbacks considerably increased the percentage of completed interviews, although diminishing returns (only 9% more interviews after the fourth attempt) suggested that further callbacks would not have been justified. Demographic comparisons of the survey sample with the national census suggested the survey population was a relatively good representation of the American population. This is indicated in Appendix 3 comparing age, sex, race and occupation for the 48 states and Alaska. The largest differences from the census were sex in the 48 state sample and the professional occupation category in both the 48 state and Alaska samples. These results suggested a slightly higher socioeconomic status profile for the survey population in comparison to the general population.

KNOWLEDGE AND AWARENESS

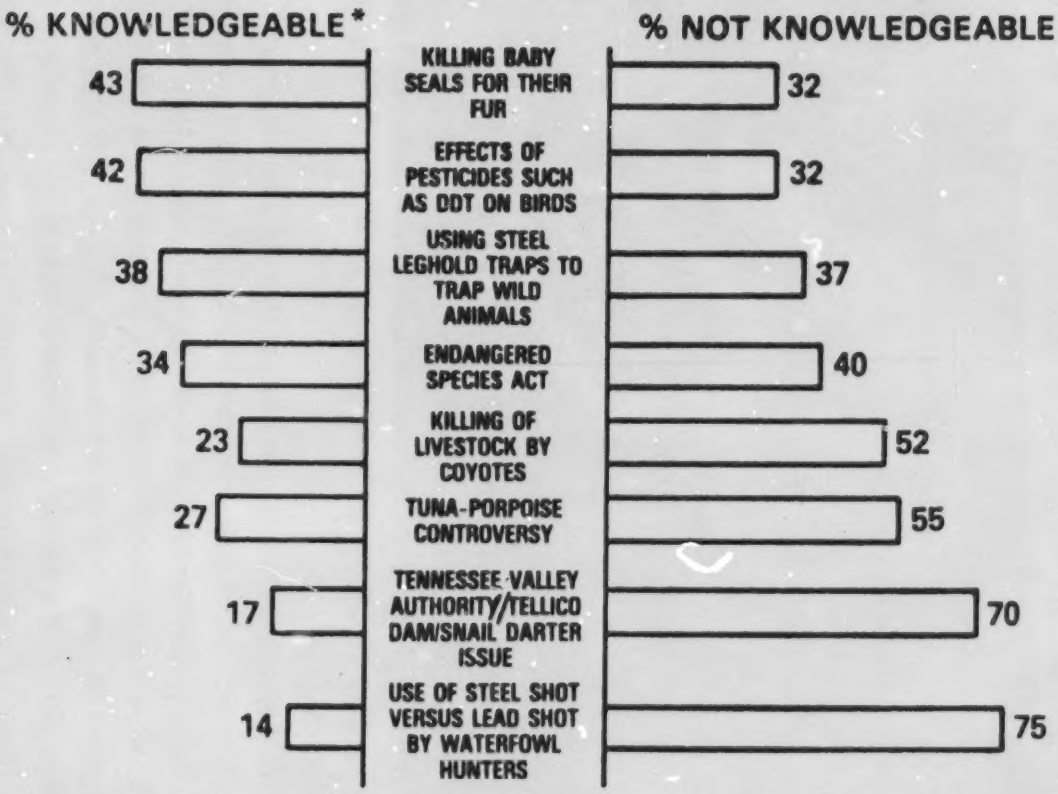
One can reasonably expect public attitudes to assume greater importance in various management and policy decisions as efforts to protect wildlife and natural habitats increasingly require major land-use decisions affecting large number of people and having broad social and economic impacts. As the public often bea the lion's share of such trade-offs, it stands only to reason that their sentiments and perceptions be somehow considered. On the other hand, professionals often encounter a public with views dependent as much on bias and misunderstanding as on an adequate comprehension of an issue's complexity. Thus, it behooves managers to assess existing levels of public understanding and, in circumstances where wildlife knowledge is judged insufficient, to provide information which, hopefully, will render people more capable of forming intelligent perceptions. course, a thin and ethically difficult line will often distinguish public awaren and educational efforts from manipulative attempts to influence people toward pr established viewpoints.

A first stage in any public information effort must, therefore, involve som assessment of people's awareness and understanding of wildlife. A limited attem at providing this information involved two measures: one directed at perceived recognition of eight relatively prominent wildlife management issues; the other, a test of factual knowledge of animals based on a 33 item true/false, multiple choice questionnaire.

Results bearing on public awareness of wildlife management issues were revi ed in a different report and are, therefore, only briefly covered here[1]. To asse this awareness, respondents were asked to indicate if they were very, moderately slightly knowledgeable, had very little knowledge or had never heard of eight wi life management issues (Figure 1 and Table 2). As this question solicited perce ed knowledge, one could expect the average person to somewhat inflate or exagger ate their level of understanding. Despite this tendency, no more than 15% of th national sample reported themselves as "very knowledgeable" on any of the eight issues. The two issues which did receive this level of recognition were the kil ing of baby seals for their fur and the use of steel leg-hold traps to capture w animals. When the very and moderately knowledgeable response categories were co bined, however, the pesticide impact on birds issue also ranked among the most recognized issues. In contrast, the two issues which received the least de gree of "very knowledgeable" responses were the Tennessee Valley Authority/Tell- ico Dam/Snail Darter controversy and the use of steel versus lead shot to hunt

FIGURE 1

AWARENESS OF SELECTED WILDLIFE ISSUES



*THE 'KNOWLEDGEABLE' CATEGORY COMBINES THE VERY AND MODERATELY KNOWLEDGEABLE GROUPS; THE 'NOT KNOWLEDGEABLE', THE VERY LITTLE KNOWLEDGE AND NEVER HEARD OF IT GROUPS. RESPONSES DO NOT ADD UP TO 100 % AS THE SLIGHTLY KNOWLEDGEABLE CATEGORY HAS NOT BEEN INCLUDED.

TABLE 2

AWARENESS OF SELECTED WILDLIFE ISSUES *

	(1) VERY KNOWLEDGEABLE		(2) MODERATELY KNOWLEDGEABLE	(3) SLIGHTLY KNOWLEDGEABLE	(4) VERY LITTLE KNOWLEDGE		(5) NEVER HEARD OF IT	$\bar{X}$
KILLING BABY SEALS FOR THEIR FUR	(361) 14.7	43	(700) 28.5	(612) 24.9	(475) 19.3	32	(307) 12.5	2.86
EFFECTS OF PESTICIDES SUCH AS DDT ON BIRDS	(329) 13.4	42	(701) 28.6	(646) 26.3	(513) 20.9	32	(265) 10.8	2.87
USING STEEL LEGHOLD TRAPS TO TRAP WILD ANIMALS	(364) 14.8	38	(578) 23.5	(611) 24.9	(589) 24.0	37	(313) 12.8	2.96
ENDANGERED SPECIES ACT	(217) 8.9	34	(619) 25.3	(636) 26.0	(542) 22.1	40	(434) 17.7	3.14
KILLING OF LIVESTOCK BY COYOTES	(157) 6.4	23	(395) 16.1	(628) 25.6	(831) 33.9	52	(442) 18.0	3.40
TUNA-PORPOISE CONTROVERSY	(214) 8.7	27	(449) 18.4	(436) 17.8	(587) 24.0	55	(761) 31.1	3.49
TENNESSEE VALLEY AUTHORITY TELLICO DAM/ SNAIL DARTER ISSUE	(117) 4.8	17	(297) 12.1	(332) 13.5	(518) 21.1	70	(1187) 48.4	3.96
USE OF STEEL SHOT VERSUS LEAD SHOT BY WATERFOWL HUNTERS	(127) 5.2	14	(227) 9.2	(259) 10.6	(206) 28.8	75	(1135) 46.3	4.02

*NUMBERS IN PARENTHESES ARE THE ACTUAL RESPONDENT COUNTS; NUMBERS TO THE FIRST DECIMAL POINT ARE THE PERCENTAGE WHO ANSWERED IN A PARTICULAR WAY; NUMBERS BETWEEN CATEGORIES SUMMARIZE THE PERCENTAGE WHO ANSWERED POSTIVIELY OR NEGATIVELY.

waterfowl.

These results also revealed that while only 9 percentage points separated the most from least known issues based on very knowledgeable responses, a much larger disparity occurred at the "never heard of the issue" level of familiarity. Specifically, whereas 11 and 13% of respondents reported they had "never heard" of the baby seal, pesticide or leg-hold trap issues, in contrast, 46 to 48% reported no recognition whatsoever of either the snail darter or lead/steel shot controversies. Even more surprising, when the "very little knowledge" and "never heard of the issue" categories were combined, some 70% of the public reported this degree of ignorance of the presumably famous snail darter issue (particularly unexpected, as the survey occurred at the time of the snail darter's most extensive publicity).

At intervening levels of recognition, but still characterized by a greater percentage of non-aware than aware respondents, were three issues: the endangered species act (34% very to moderately knowledgeable), the killing of livestock by coyotes (23%), and the tuna-porpoise controversy (27%). Although recognition of the endangered species act was far greater than the Tellico Dam/Snail Darter issue, a remarkable 40% of the American public still reported little or no knowledge of the former issue. Awareness of the coyote/livestock problem was the same as reported in a national study conducted by Stuby, Gum, Arthur, Carpenter and Shaw.[2]

A number of impressions can be derived from these results. First, the public was not especially aware of any of the issues, with no issue recognized to a moderate or very knowledgeable extent by a majority of those surveyed. Secondly, as suggested in a previous report, when comparing the most with the least recognized issues, the public appeared to be far more aware and, in all likelihood, concerned about relatively emotional issues involving specific, attractive, large and phylogenetically "higher" animals, than issues involving indirect impacts on wildlife and dealing with biologically unfamiliar and "lower" animals.[3] Finally, a wide disparity appeared to exist between the public and the professional wildlife manager regarding the most important wildlife issues. For example, to most wildlife managers, the baby seal controversy is of minor, superficial significance, whereas to the public, this issue was the most recognized. In contrast, the steel vs. lead shot controversy appeared to be of marginal relevance to the general public, although this issue represents a very important concern of contemporary wildlife management.[4]

Factual knowledge of animals was explored through a 33 true-false, multiple choice question scale. Over 500 questions were considered in developing this scale with the following criteria used as the basis for item selection: avoidance of questions biased toward the specialized knowledge of particular groups (e.g., hunters, birders), varying levels of difficulty, diverse sources of knowledge (e.g., scientific, reading, personal experience, folk), different classes of animals (all vertebrate classes as well as six questions on invertebrates), contemporary as well as historical issues, and domestic and wild animals. Five pretests were conducted in developing this scale. Scale scores were roughly normally distributed for the national sample with an overall mean of 52.8 on a range of scores from 0 to 100 (Figure 2).

An examination of individual knowledge question results, as well as findings regarding groups of generically related questions, provided some insight on the public's knowledge of animals. For the most part, Americans appeared to possess an extremely limited understanding of animals. For example, on four endangered species questions, no more than one-third of the public gave the correct answer --e.g., only 26% knew the manatee is not an insect, and 25% correctly answered the question, "timber wolves, bald eagles and coyotes are all endangered species of animals" (Table 3). Additionally, just 13% knew raptors are not small rodents and one-half of the national sample incorrectly answered the question, "spiders have ten legs". A better but still limited 54% knew veal does not come from lamb, and only 57% correctly answered the question, "most insects have backbones".

On the other hand, four questions were accurately answered by at least 70% of the general public. These questions dealt with human injury inflicted by animals, highly familiar animals, common historical practices and domestic animals. Specifically, 84% correctly answered the question, "the copperhead, cottonmouth, coral and rattlesnake are all poisonous snakes"; 80%, "the mule is a cross between a donkey and a horse"; 71%, "the sea horse is a kind of fish"; and, 70%, "bounties are still used in some parts of the country for the purpose of controlling predators". Indicative of a possible difference in knowledge of animals based on human injury versus biological characteristics of animals were two questions dealing with snakes. Specifically, although 84% correctly answered the question about poisonous snakes, only 52% knew the answer to the question, "snakes are covered by a thin layer of slime in order to move more easily".

The 33 knowledge questions were divided into nine generic categories. A comparison of the mean correct scores for each category revealed the public was most

Figure 2

KNOWLEDGE SCALE RESPONSE DISTRIBUTION

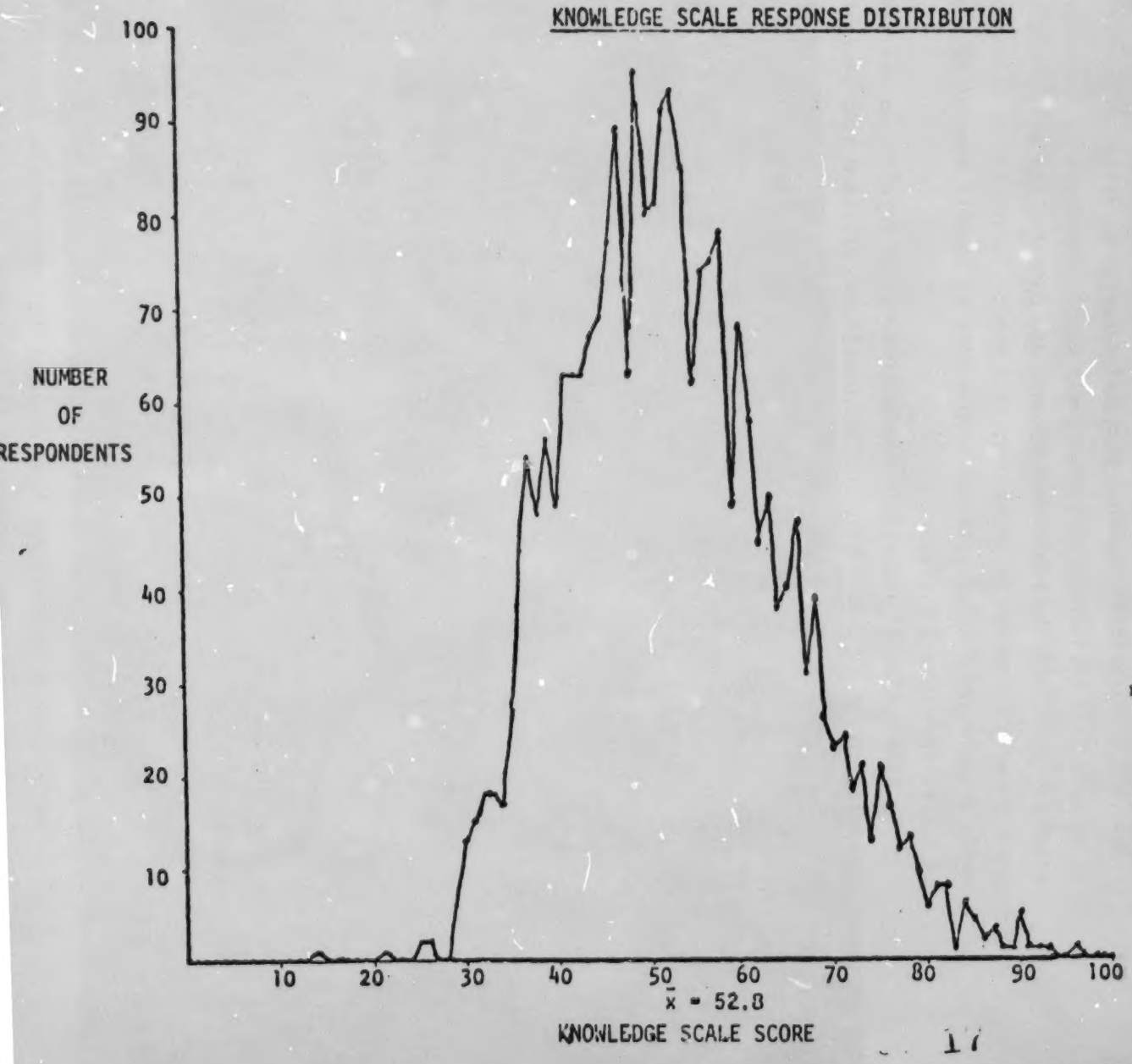


TABLE 3
KNOWLEDGE OF ENDANGERED SPECIES

	% CORRECT ANSWER	% WRONG ANSWER	% DON'T KNOW
THE PASSENGER PIGEON AND THE CAROLINA PARAKEET ARE NOW EXTINCT.	26.2	23.1	50.6
PESTICIDES WERE A MAJOR FACTOR IN THE DECLINE OF BROWN PELICANS.	33.3	9.9	56.8
THE MANATEE IS AN INSECT.	25.6	23.1	51.3
TIMBER WOLVES, BALD EAGLES, AND COYOTES ARE ALL ENDANGERED SPECIES OF ANIMALS.	24.5	61.7	13.8
MEAN CORRECT ANSWER	27.4		

knowledgeable about human injury inflicted by animals ($\bar{x}$ = 63.4), the basic characteristics of animals (e.g., "all adult birds have feathers", $\bar{x}$ = 55.3) and domestic animals ($\bar{x}$ = 53.4). On the other hand, they were least knowledgeable about endangered species ($\bar{x}$ = 27.4), superstition and myth (e.g., "North American Tarantulas are extremely poisonous to man", $\bar{x}$ = 33.2), invertebrates ($\bar{x}$ = 34.7), the taxonomic characteristics of animals (e.g., "Koala bears are not really bears", $\bar{x}$ = 38.5), wildlife management and history ($\bar{x}$ = 43.6) and predators ($\bar{x}$ = 47.1) (Table 4). Mean scores for the 9 knowledge categories, and responses on specific questions, are indicated in Tables 4 through 12.

Knowledge of animals was also explored by comparing the scale scores of various demographic and animal-related activity groups in the American population. The bar graph in Figure 3 indicates particularly high and low scoring demographic groups on the knowledge scale from over sixty groups examined. To partially account for possible confounding interrelationships among these groups (e.g., race and income being so highly interrelated that racial differences were a function of lower socioeconomic levels among non-whites), analysis of variance and multiple classification analysis tests were performed. According to these results, differences within categories of all major demographic variables were significant on the knowledge scale with the exception of occupation and, to a limited extent, marital status (significant at barely the .05 confidence level) (Table 13). In all likelihood, occupational group differences were largely a function of education, while marital status variations mostly a consequence of age. According to multiple classification analysis results, demographic groups with the greatest knowledge of animals were the college educated, especially those with a graduate school education, residents of Alaska and the Rocky Mountain states, males and those who rarely or never participated in religious services. In contrast, blacks, respondents with less than an 11th grade education, residents of very large cities, and persons over 76 and, ironically, under 25 years of age had the lowest knowledge scores (Table 14).

Nearly every animal-related activity group scored above the general population mean on the knowledge scale. Especially high knowledge scores were obtained by bird-watchers, members of various conservation-related organizations, hunters who hunted primarily to be close to nature, scientific hobbyists, and members of the National Trappers, National Cattlemen's and American Sheep Producers' Associations. Among demographic groups, only respondents with a graduate school education and residents of Alaska had comparably high knowledge scores. Animal-related activity groups with relatively low knowledge scores included zoological parks visitors, hunt-

TABLE 4
MEAN CORRECT SCORE X TYPES OF
KNOWLEDGE QUESTIONS

HUMAN INJURY	63.4
BIOLOGICAL CHARACTERISTICS	55.3
DOMESTIC ANIMALS	53.4
PREDATORS	47.1
WILDLIFE MANAGEMENT/HISTORY	43.6
TAXONOMIC CHARACTERISTICS	38.5
INVERTEBRATES	34.7
SUPERSTITION/MYTH	33.2
ENDANGERED SPECIES	27.4

TABLE 5

KNOWLEDGE OF HUMAN INJURY

	% CORRECT ANSWER	% WRONG ANSWER	% DON'T KNOW
NORTH AMERICAN TARANTULAS ARE EXTREMELY POISONOUS TO MAN.	35.8	46.6	17.7
BOUNTIES ARE STILL USED IN SOME PARTS OF THE COUNTRY TO CONTROL PREDATORS	70.2	05.1	24.7
THE COPPERHEAD, COTTONMOUTH, CORAL SNAKE AND RATTLESNAKE ARE ALL POISONOUS SNAKES.	84.2	08.1	07.7
MEAN CORRECT ANSWER	63.4		

TABLE 6

KNOWLEDGE OF BIOLOGICAL CHARACTERISTICS

	% CORRECT ANSWER	% WRONG ANSWER	% DON'T KNOW
SPIDERS HAVE 10 LEGS.	49.8	18.3	31.9
THE SKELETONS OF SHARKS AND STING RAYS ARE MADE OF CARTILAGE RATHER THAN BONE.	43.8	21.2	35.0
ALL ADULT BIRDS HAVE FEATHERS.	62.9	22.1	14.9
SNAKES HAVE A THIN COVERING OF SLIME IN ORDER TO MOVE MORE EASILY.	51.8	30.5	17.7
MOST INSECTS HAVE BACKBONES.	57.1	12.8	30.0
SALMON BREED IN FRESH WATER BUT SPEND MOST OF THEIR LIVES IN SALT WATER.	66.3	15.8	17.8
MEAN CORRECT ANSWER	55.3		

TABLE 7

KNOWLEDGE OF DOMESTIC ANIMALS

	% CORRECT ANSWER	% WRONG ANSWER	% DON'T KNOW
A MULE IS A CROSS BETWEEN A DONKEY AND A HORSE.	79.7	12.0	08.2
A MANX IS A BREED OF LONG-HAIRED DOG.	46.2	13.0	40.8
VEAL COMES FROM LAMB.	54.0	40.4	05.7
WHEN A HORSE GALLOPS, ALL FOUR FEET WILL LIFT OFF THE GROUND AT THE SAME TIME.	43.5	44.3	12.2
THE LENGTH OF PREGNANCY FOR A DOG IS GENERALLY FIVE MONTHS	43.5	20.6	35.9
MEAN CORRECT ANSWER	53.4		

TABLE 8

WILDLIFE MANAGEMENT/HISTORY

(EXCLUDING ENDANGERED SPECIES)

	% CORRECT ANSWER	% WRONG ANSWER	% DON'T KNOW
BOUNTIES ARE STILL USED IN SOME PARTS OF THE COUNTRY TO CONTROL PREDATORS.	70.2	05.1	24.7
THE STARLING WAS INTRODUCED INTO THE UNITED STATES.	40.1	09.3	50.6
WHICH OF THE FOLLOWING IS THE MOST TRAPPED WILD ANIMAL FOR ITS FUR IN THE U.S.: NUTRIA, MUSKRAT, FOX OR BOBCAT.	45.0	52.8	2.2
APPROXIMATELY HOW MANY ACRES ARE PRESENTLY IN THE NATIONAL WILDLIFE REFUGE SYSTEM IN THE UNITED STATES: 500,000, 2 MILLION, 18 MILLION OR 33 MILLION.	19.2	72.3	8.5
MEAN CORRECT ANSWER	43.6		

TABLE 9

KNOWLEDGE OF TAXONOMIC CHARACTERISTICS

	% CORRECT ANSWER	% WRONG ANSWER	% DON'T KNOW
LEPIDOPTERA IS AN ORDER OF INSECTS THAT INCLUDES BEES.	16.6	15.8	67.8
A MULE IS A CROSS BETWEEN A DONKEY AND A HORSE.	79.7	12.0	8.2
THE SEA HORSE IS A KIND OF FISH.	70.6	17.1	12.3
RAPTORS ARE SMALL RODENTS.	12.6	13.6	73.8
THE SPRING PEEPER IS A KIND OF FROG.	27.3	15.8	56.8
A MANX IS A BREED OF LONG-HAIRED DOG.	46.2	13.0	40.8
ALL OF THE FOLLOWING ARE MAMMALS--IMPALA, MUSKRAT, IGUANA, KILLER WHALE.	40.4	38.8	20.8
KOALA BEARS ARE NOT REALLY BEARS.	42.1	35.8	22.1
THE MANATEE IS AN INSECT.	25.6	23.1	51.3
INCH WORMS ARE IN THE SAME FAMILY OF ANIMALS AS EARTH WORMS.	23.4	43.1	33.5
MEAN CORRECT ANSWER	38.5		

TABLE 10

KNOWLEDGE OF INVERTEBRATES

	% CORRECT ANSWER	% WRONG ANSWER	% DON'T KNOW
SPIDERS HAVE TEN LEGS.	49.8	18.3	31.9
LEPIDOPTERA IS AN ORDER OF INSECTS THAT INCLUDES BEES.	16.6	15.8	67.6
NORTH AMERICAN TARANTULAS ARE EXTREMELY POISONOUS TO MAN.	35.8	46.6	17.7
INCH WORMS ARE IN THE SAME FAMILY OF ANIMALS AS EARTH WORMS.	23.4	43.1	33.5
MOST INSECTS HAVE BACKBONES.	57.1	12.8	30.0
THE MANATEE IS AN INSECT	25.6	23.1	51.3
MEAN CORRECT ANSWER	34.7		

TABLE 11

KNOWLEDGE OF SUPERSTITION/MYTH

	% CORRECT ANSWER	% WRONG ANSWER	% DON'T KNOW
NORTH AMERICAN TARANTULAS ARE EXTREMELY POISONOUS TO MAN.	35.8	46.0	17.7
WHEN FRIGHTENED, AN OSTRICH WILL BURY ITS HEAD IN THE SAND.	30.7	55.3	14.0
MEAN CORRECT ANSWER	33.2		

TABLE 12

KNOWLEDGE OF PREDATORS

	% CORRECT ANSWER	% WRONG ANSWER	% DON'T KNOW
THE SKELETONS OF SHARKS & STING RAYS ARE MADE OF CARTILAGE RATHER THAN BONE.	43.8	21.2	35.0
BOUNTIES ARE STILL USED IN SOME PARTS OF THE COUNTRY TO CONTROL PREDATORS.	70.2	05.1	24.7
THE COPPERHEAD, COTTONMOUTH, CORAL SNAKE AND RATTLESNAKE ARE ALL POISONOUS SNAKES.	84.2	08.1	07.7
TIMBER WOLVES, BALD EAGLES AND COYOTES ARE ALL ENDANGERED SPECIES OF ANIMALS.	24.5	61.7	13.8
RAPTORS ARE SMALL RODENTS.	12.6	13.6	73.8
MEAN CORRECT ANSWER	47.1		

FIGURE 3

ANIMAL KNOWLEDGE SCALE MEANS BY SELECTED DEMOGRAPHIC GROUPS 1978 NATIONAL SAMPLE

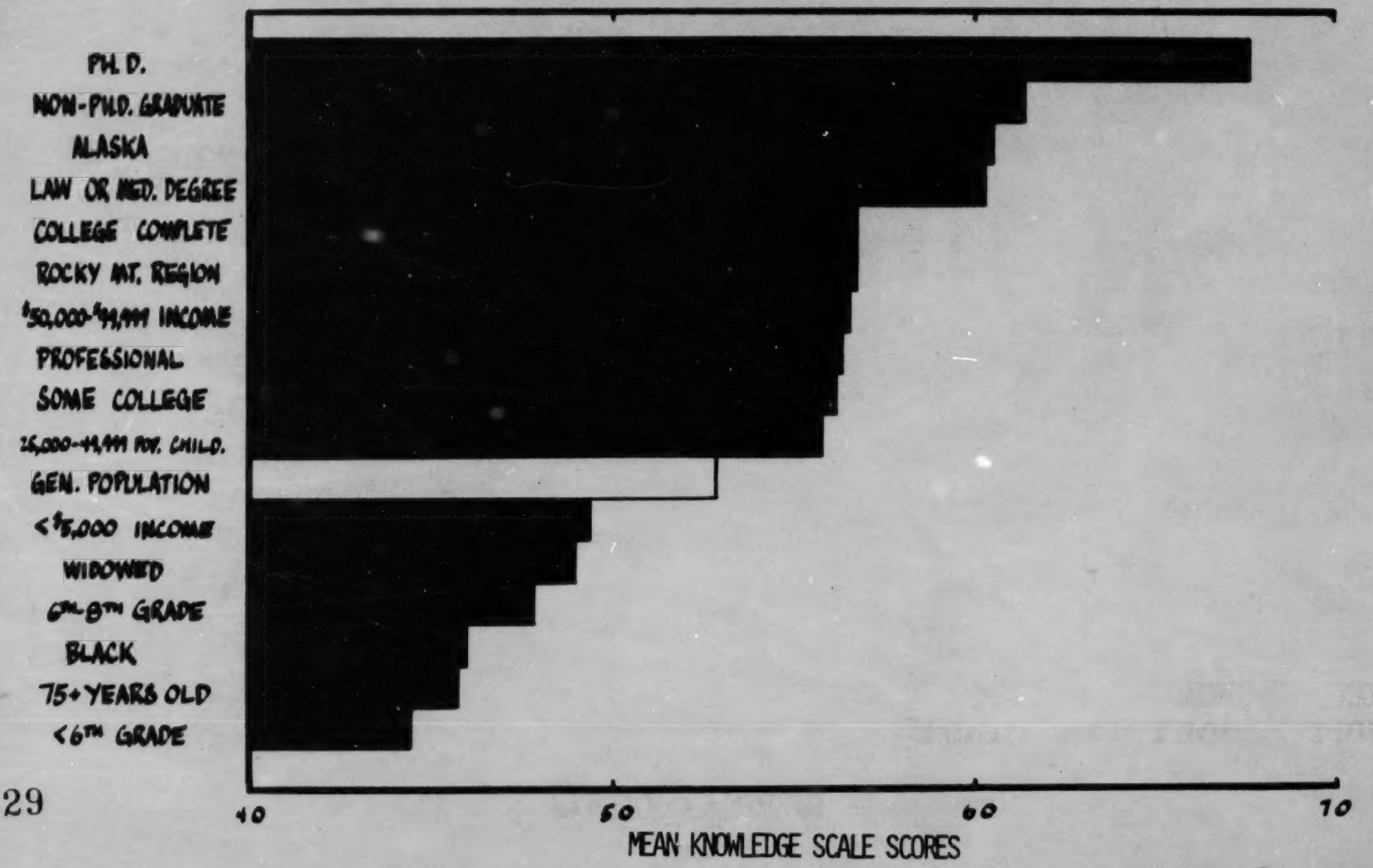


TABLE 13

ANALYSIS OF VARIANCE RESULTS:
SELECTED DEMOGRAPHIC VARIABLES X KNOWLEDGE SCALE

	F.	SIG. OF F.
AGE	7.67	0.000
POPULATION OF PRESENT RESIDENCE	3.09	0.005
REGION	4.45	0.000
EDUCATION	31.83	0.000
OCCUPATION	0.23	0.950
RELIGIOUS ATTENDANCE	4.75	0.001
INCOME	5.31	0.000
MARITAL STATUS	3.06	0.047
RACE	30.31	0.000
SEX	66.82	0.000

TABLE 14

KNOWLEDGE SCALE

MULTIPLE CLASSIFICATION ANALYSIS RESULTS:

15 LARGEST POSITIVE AND NEGATIVE DEVIATIONS FROM OVERALL SAMPLE MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES

LARGEST POSITIVE		LARGEST NEGATIVE	
GRADUATE EDUCATION	7.73	BLACK	-5.50
ALASKA	4.86	≤8TH GRADE EDUCATION	-5.10
ROCKY MOUNTAIN REGION	2.75	9-11TH GRADE EDUCATION	-3.36
COLLEGE EDUCATION	2.36	76 + YEARS OLD	-3.12
MALE	2.18	18-25 YEARS OLD	-2.30
RARELY OR NEVER RELIGIOUS ATTENDANCE	1.96	1 MILLION + POPULATION OF RESIDENCE	-2.07
56-75 YEARS OLD	1.57	FEMALE	-1.62
2,000-9,999 POPULATION OF RESIDENCE	1.53	HIGH SCHOOL OR VOC/TECH EDUCATION	-1.27
500-1,999 POPULATION OF RESIDENCE	1.40	1-3 TIMES PER MONTH RELIGIOUS ATTENDANCE	-1.22
PACIFIC REGION	1.12	NORTHEAST REGION	-1.17
36-55 YEARS OLD	0.84	SINGLE	-0.96
$20,000-34,999 ANNUAL INCOME	0.72	ONCE OR MORE PER WEEK RELIGIOUS ATTENDANCE	-0.95
<500 POPULATION OF RESIDENCE	0.65	FARMERS	-0.94
$35,000 + ANNUAL INCOME	0.64	250,000-999,999 POPULATION OF RESIDENCE	-0.74
WHITE	0.57	SOUTHERN REGION	-0.53

ers who hunted primarily for sport or recreation, anti-hunters and fishermen (Figure 4).

To obtain a better understanding of factors related to knowledge of animals, all respondents with very high or low knowledge scores were specifically examined (Table 15). As might be expected, given the previously cited results, more than 50% of those with a college education were among the highest knowledge scorers compared to only 17% among those with less than an 8th grade education. Additionally, 45% of respondents earning in excess of $15,000 per year were in the highest knowledge scoring group compared to 27% among those earning below $15,000 per annum. Urban-rural differences were not significant, although disproportionately fewer high knowledge scorers resided in the most urban areas. Regionally, a significantly greater proportion of Rocky Mountain and especially Alaska residents were among the high knowledge scorers, with the Northeastern states contrasting the most. Finally, a far larger proportion of females, blacks and persons over 75 years of age were in the low knowledge group.

Some interesting patterns also emerged when high and low knowledge groups were compared in terms of basic attitudes toward animals (Table 16).* Naturalistic and ecologistic attitude scale differences, for example, were especially large with those very knowledgeable about animals revealing far more interest in wildlife and concern for the health and functioning of natural systems. Although significant differences were also found on the humanistic and moralistic scales, these were much smaller. Apparently, persons very knowledgeable about animals were more oriented to wildlife and the outdoors than individual, pet animals or animal rights issues. High knowledge scorers also revealed a strong willingness to sacrifice various material benefits to protect wildlife and natural habitats as suggested by very low utilitarian scores.

SPECIES PREFERENCE

Some information on preference for varying animal species was described in a previous report when discussing public willingness to incur diverse socioeconomic impacts for the sake of protecting endangered wildlife or to control damage inflicted on livestock[5]. As reported, species with considerable aesthetic appeal, biologically close to humans, and culturally and historically important, tended to evoke a much greater public inclina-

*Definitions of the attitudes and description of the scales used to measure the attitudes can be found on pages 41 - 53.

FIGURE 4

ANIMAL KNOWLEDGE SCALE MEANS BY SELECTED ANIMAL ACTIVITY GROUPS

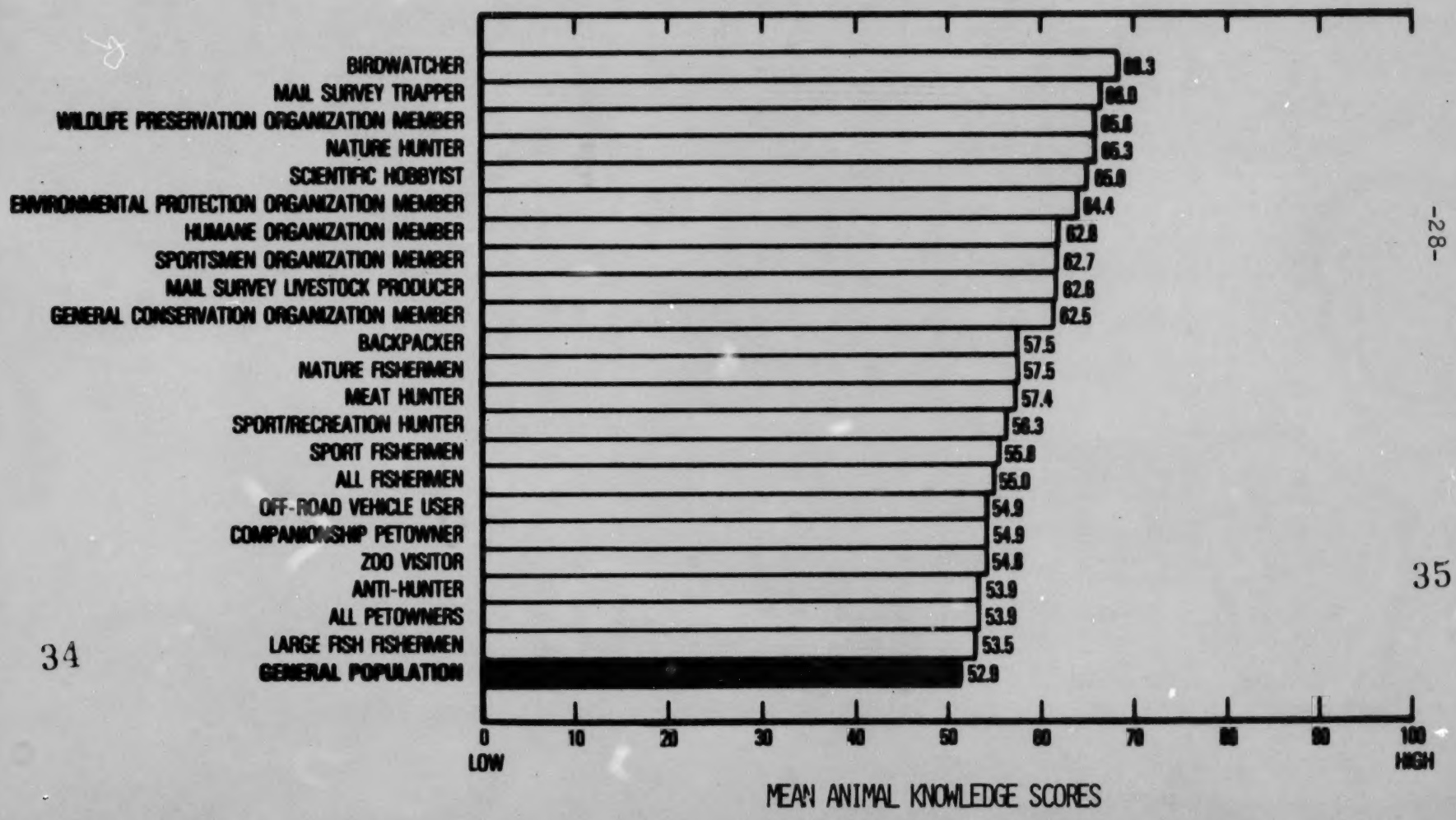


TABLE 15

% HIGH AND LOW KNOWLEDGE SCALE SCORERS X SELECTED DEMOGRAPHIC GROUPS*

	% Low Knowledge	% High Knowledge
Education		
≤8th grade	51	17
9-Vocational/ Technical	36	30
College	22	46
Graduate School	12	64
P = ≤.001		
Income		
≤$4,999-14,999	37	27
$15,000-50,000	23	45
P = ≤.001		
Population Present Residence		
≤1,999	29	37
2,000-9,999	27	39
10,000-49,999	27	40
50,000-249,999	27	38
250,000-999,999	29	38
1 million +	38	29
P = .360		
Region		
Northeast	38	29
Northcentral	28	35
South	35	32
Rocky Mountains	22	52
Pacific Coast	25	43
Alaska	14	60
P = ≤.001		

	% Low Knowledge	% High Knowledge
Sex		
Male	24	44
Female	37	28
P = ≤.001		
Race		
White	29	38
Black	55	10
P = ≤.001		
Age		
18-25	35	29
26-45	29	40
46-65	29	37
66-75	34	30
75 +	51	11
P = ≤.001		

*Low knowledge scorers = 776 respondents or 32% of the sample with scores from 14-46; high scorers = 886 respondents or 35% of the sample with scores ranging from 57 - 96.

TABLE 16

LOW AND HIGH KNOWLEDGE SCORERS X ATTITUDE SCALE MEANS

	NATURALISTIC	ECOLOGISTIC	HUMANISTIC	MORALISTIC	SCIENTISTIC	UTILITARIAN	DOMINIONISTIC	NEGATIVISTIC
LOW KNOW. GROUP MEAN	1.373	2.354	3.282	3.804	0.710	5.723	2.378	5.526
HIGH KNOW. GROUP MEAN	5.301	5.034	4.023	6.493	1.909	3.472	1.953	2.299
F VALUE	172.671	91.196	7.079	31.510	44.984	32.115	2.529	130.674
SIG. OF F	0.000	0.000	0.008	0.000	0.000	0.000	0.113	0.000

tion to forego a variety of benefits to assure their well-being. Animals in this category included the Bald Eagle, Eastern mountain lion, Agassiz trout, American crocodile, Silverspot butterfly, Grizzly Bear and unspecified species of squirrel, rabbit, porpoise, fox and raccoon. On the other hand, the public indicated very little desire to render sacrifices to protect the Eastern Indigo snake, Kauai Wolf spider, or unidentified species of blackbird, rat, bat, fish or, somewhat surprisingly, whale (cf. Figures 5 and 6).

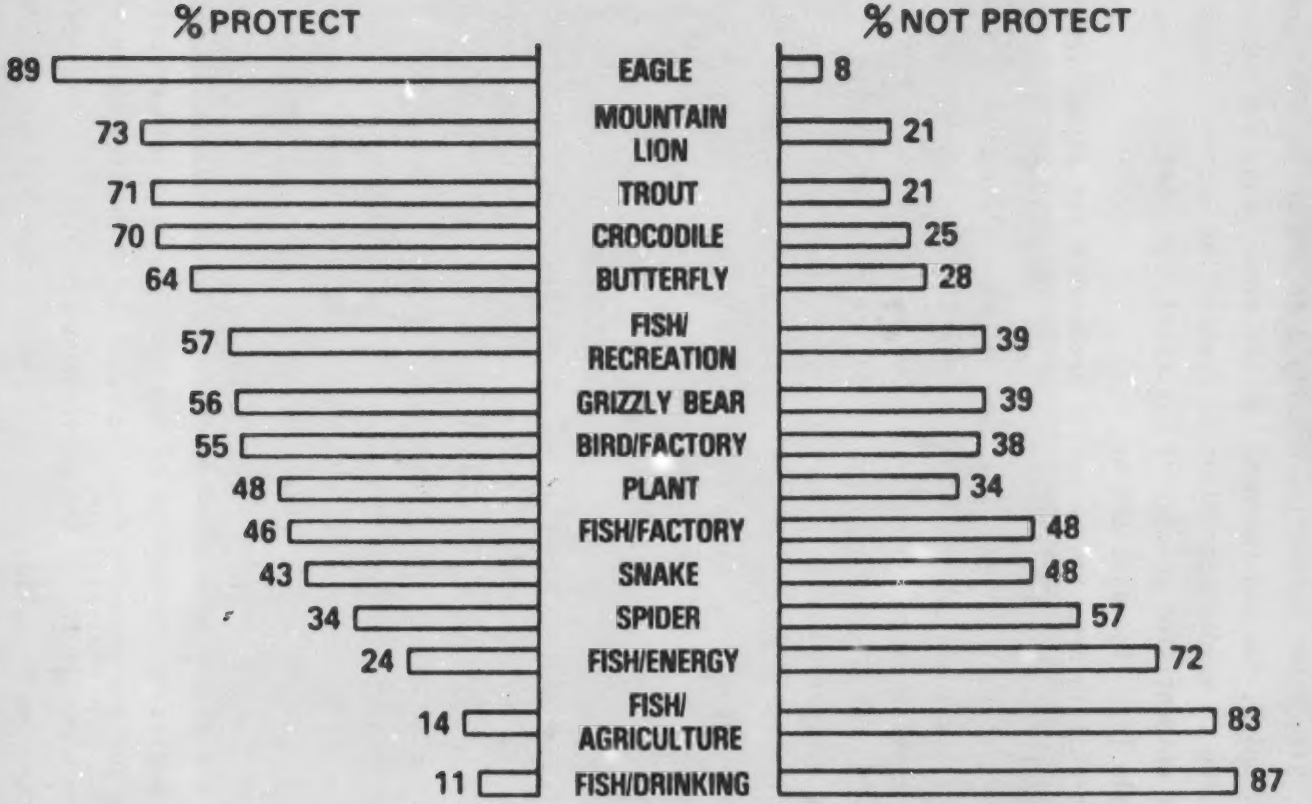
Additional information on public preference for animal species was obtained by examining responses to a 33 animal like/dislike question involving seven response alternatives: strongly like, like, slightly like, neither like nor dislike, slightly dislike, dislike and strongly dislike. As revealed in Table 17, the best liked species were two well-known domestic animals -- the horse and dog. In contrast, the cat was far less preferred, ranking 12th overall. The third and fourth most preferred animals were two bird species -- the swan and robin -- likely beneficiaries of their familiarity and aesthetic appeal. The butterfly, another highly aesthetic animal, was fifth in overall preference -- the only invertebrate to rank among the twelve best liked animals. The trout and salmon ranked sixth and seventh, respectively, reflecting the probable importance of game species in American culture. This possibility was additionally suggested by the public's willingness to incur substantial socioeconomic impacts to protect an endangered trout species, but their unwillingness to do so for an unknown fish (see Figure 6).

The eagle was the eighth best liked animal, the highest ranking predator, and probably related to its historical significance in American culture. The elephant ranked nineth overall, the highest rating among non-native animals. The owl was 10th and the turtle eleventh; the latter, the highest ranking amphibian or reptile. The ladybug was 13th, again attesting to the importance of aesthetic factors in favorable attitudes toward invertebrates. The raccoon, moose, whale and walrus were near the middle in overall preference -- ranking 14-17th, respectively. A similarly ambivalent perception of the bear (ranking 18th overall) may have been related to anxiety stemming from its capacity to inflict human injury.

At the opposite end of the preference spectrum, the six most disliked animals -- the cockroach, mosquito, rat, wasp, rattlesnake and bat -- are all associated with human injury or disease. Moreover, three of the four are biting and stinging invertebrates. Relatedly, the eighth and ninth most disliked animals -- the shark and skunk -- typically are identified with human injury or damage. Only the vulture, of the nine most disliked animals, is not directly identified with human in-

FIGURE 5

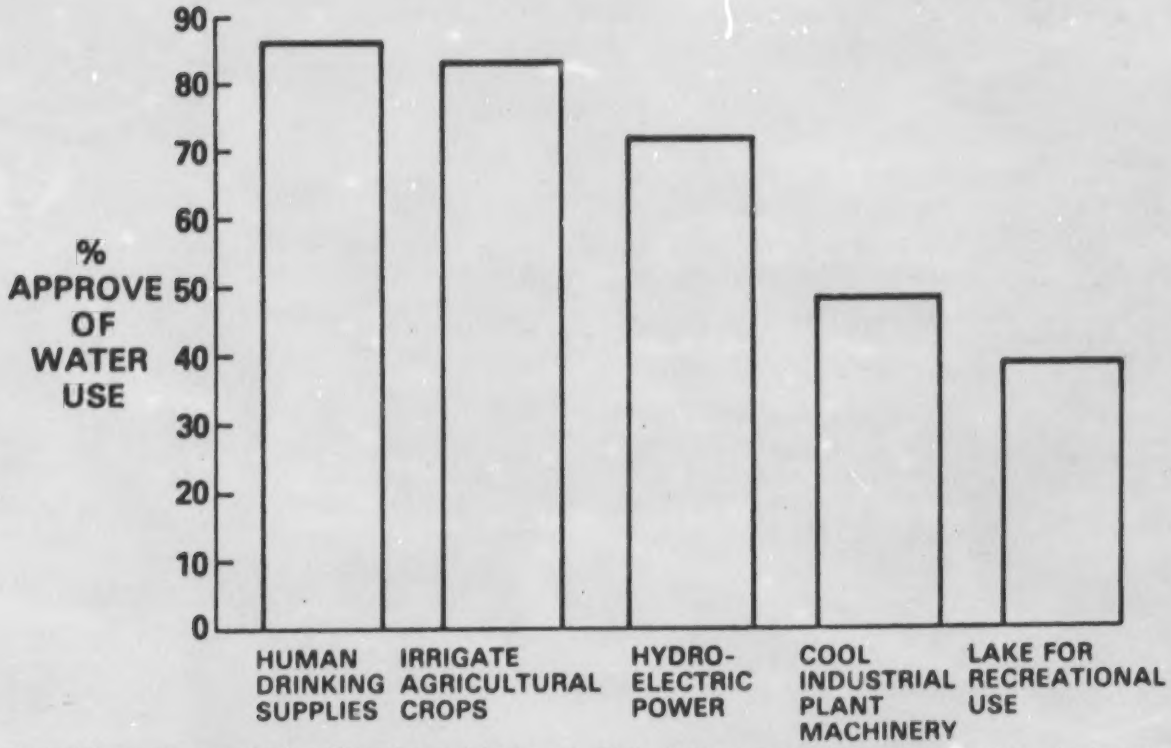
WILLINGNESS TO PROTECT DIFFERENT ENDANGERED SPECIES



*QUESTIONS WERE ASKED ON PROTECTING ENDANGERED FORMS OF THESE ANIMALS IN THE CONTEXT OF VARIOUS SOCIOECONOMIC IMPACTS. IN CASES WHERE ONLY THE ANIMALS CLASS IS NOTED, THE HUMAN USE IMPACT IS INDICATED (E.G., "FISH/RECREATION").

FIGURE 6

APPROVE OF DIVERSE WATER USES IF ENDANGER SPECIES OF FISH X GENERAL PUBLIC



The question was worded: "Various kinds of fish have been threatened with extinction because of dams, canals and other water projects. Please indicate if you would approve of the following water uses if they were to endanger a species of fish. That is, would you strongly approve, approve, slightly approve, slightly disapprove, disapprove or strongly disapprove of.....

Water diverted to cool industrial plant machinery; Water dammed to provide hydroelectric energy power; Water diverted to increase human drinking supplies; Water dammed to make a lake for recreational use; Water diverted to irrigate agricultural crops".

TABLE 17

ANIMAL PREFERENCE MEANS * **

RANK	$\bar{X}$	STANDARD DEVIATION	RANK	$\bar{X}$	STANDARD DEVIATION
1. DOG	1.70	0.98	18. BEAR	2.97	1.57
2. HORSE	1.79	0.85	19. FROG	3.18	1.44
3. SWAN	1.97	0.98	20. GORILLA	3.74	1.67
4. ROBIN	1.99	1.02	21. WOLF	3.98	1.86
5. BUTTERFLY	2.04	1.01	22. COYOTE	4.02	1.70
6. TROUT	2.12	1.04	23. CROW	4.06	1.67
7. SALMON	2.26	1.11	24. LIZARD	4.13	1.85
8. EAGLE	2.29	1.34	25. SKUNK	4.42	1.93
9. ELEPHANT	2.63	1.31	26. SHARK	4.82	1.77
10. OWL	2.66	1.42	27. VULTURE	4.91	1.65
11. TURTLE	2.69	1.28	28. BAT	5.35	1.69
12. CAT	2.74	1.70	29. RATTLESNAKE	5.66	1.58
13. LADYBUG	2.78	1.49	30. WASP	5.68	1.46
14. RACCOON	2.80	1.50	31. RAT	6.26	1.18
15. MOOSE	2.81	1.39	32. MOSQUITO	6.27	1.06
16. WHALE	2.88	1.51	33. COCKROACH	6.45	1.00
17. WALRUS	2.90	1.41			

* THE RESPONSE RANGE INCLUDED:
1 = STRONGLY LIKE; 2 = LIKE; 3 = SLIGHTLY LIKE; 4 = NEITHER LIKE NOR DISLIKE;
5 = SLIGHTLY DISLIKE; 6 = DISLIKE; 7 = STRONGLY DISLIKE

**THE SPECIFIC LIKE/DISLIKE RESPONSE DISTRIBUTION FOR EACH ANIMAL IS INDICATED IN APPENDIX FOUR.

jury or harm, although this animal is often associated with death and disease. The lizard and crow were the 10th and 11th least liked animals; in all likelihood, a function of their relative lack of aesthetic appeal. However, a nearly equal proportion of respondents liked as disliked these latter two animals; an ambivalence also reflected in high standard deviation scores. Similarly, nearly the same proportion of persons expressed negative as positive views of the coyote and wolf -- the 12th and 13th least preferred animals. An ambivalent attitude toward the wolf was somewhat surprising as this animal has received much favorable media attention in recent years. Nevertheless, the predatory and property damaging history of the wolf and coyote may be responsible for the uncertain feelings of many Americans toward these animals. Finally, the gorilla and frog ranked 19th and 20th overall.

Species preference was further explored by grouping animals on the basis of generic qualities and computing mean scores for each of these groups (Table 18). The three most preferred categories of animals were domestic, aesthetically attractive and game animals. In contrast, the three least preferred types were biting and stinging invertebrates, unattractive animals and animals capable of inflicting human injury. Relatively ambivalent views were expressed toward predators and animals known to cause human property damage. Among vertebrates, birds and mammals were preferred over fish, amphibians or reptiles, while invertebrates ranked far below any vertebrate class.

Based on responses for all 33 animals, an animal preference scale was developed. The overall national sample mean was 3.54, almost at the mid-point of the scoring range and a relatively good indicator of the scale's differentiating ability. Animal preference scores were computed for all major demographic groups and are indicated in Tables 19-21. All demographic variables were significantly related with the exception of population of present residence. Especially large differences were found among age, race, education, occupation, income and regional groups. The highest overall animal preference scores (Table 22) were characteristic of Alaskans, respondents with a graduate school or college education, students, residents of the Pacific Coast, high income persons, professionals and skilled craftsmen. In marked contrast, the least favorable perceptions of animals were associated with the elderly, respondents with limited education, blacks, farmers, residents of the South and very low income persons.

A qualitative assessment of the animal preference results suggested 12, non-mutually exclusive factors as important determinants of public perception of vary-

TABLE 18

SPECIES PREFERENCE MEAN SCORES
FOR SELECTED ANIMAL CATEGORIES

ANIMAL CATEGORY	MEAN SCORE*
DOMESTIC ANIMALS	2.08
ATTRACTIVE ANIMALS	2.38
GAME ANIMALS	2.59
BIRDS	2.98
MAMMALS	3.40
AMPHIBIANS, REPTILES, FISH	3.55
PREDATORS	3.91
ANIMALS KNOWN TO CAUSE HUMAN PROPERTY DAMAGE	4.02
INVERTEBRATES	4.64
ANIMALS KNOWN TO INFLICT HUMAN INJURY	5.08
UNATTRACTIVE ANIMALS	5.46
BITING AND STINGING INVERTEBRATES	6.13

* THE LOWER THE MEAN SCORE, THE GREATER THE PREFERENCE. THE SCALE RANGE IS FROM 1 TO 7.

TABLE 19

SPECIES PREFERENCE SCALE MEANS X MAJOR DEMOGRAPHIC GROUPS*

AGE

	MEAN
18-25	3.37
26-35	3.39
36-45	3.55
46-55	3.60
56-65	3.59
66-75	3.78
76 +	4.02

F. = 16.36, P = ≤.0001

SEX

	MEAN
MALE	3.40
FEMALE	3.65

F. = 55.15, P = ≤.0001

RACE

	MEAN
WHITE	3.51
BLACK	3.90

F. = 48.75, P = ≤.0001

OCCUPATION

	MEAN
PROFESSIONALS	3.36
MANAGERS	3.39
CLERICAL/SALES	3.66
SALES AGENT/BROKER	3.54
CRAFTSMEN	3.36
OPERATIVES	3.60
SERVICE WORKERS	3.62
FARMERS	3.80
LABORERS	3.61
STUDENTS	3.24

F. = 5.41, P = ≤.0001

* THE LOWER THE SCORE, THE GREATER THE SPECIES PREFERENCE.

THE OVERALL SAMPLE MEAN = 3.54

TABLE 20

SPECIES PREFERENCE SCALE MEANS X MAJOR DEMORGRAPHIC GROUPS*

EDUCATION

	MEAN
0-5TH GRADE	3.91
6-8TH GRADE	3.89
9-11TH GRADE	3.70
12TH GRADE	3.61
VOC/TECH SCHOOL	3.59
SOME COLLEGE	3.35
COLLEGE COMPLETE	3.38
SOME GRADUATE SCHOOL	3.08
M.S.	3.15
PH.D.	3.23

$F. = 18.04$, $P = \leq .0001$

INCOME

	MEAN
<$4,999	3.72
$5,000-9,999	3.65
$10,000-14,999	3.59
$15,000-19,999	3.42
$20,000-24,999	3.46
$25,000-34,999	3.32
$35,000-49,999	3.29
$50,000 +	3.32

$F. = 9.36$, $P. = \leq .0001$

* THE LOWER THE SCORE, THE GREATER THE SPECIES PREFERENCE.

THE OVERALL SAMPLE MEAN = 3.54

TABLE 21

SPECIES PREFERENCE SCALE MEANS X MAJOR DEMOGRAPHIC GROUPS*

POPULATION OF PRESENT RESIDENCE

	MEAN
< 500 POPULATION	3.64
500-1,999 POPULATION	3.55
2,000-4,999 POPULATION	3.51
5,000-9,999 POPULATION	3.65
10,000-24,999 POPULATION	3.60
25,000-49,999 POPULATION	3.41
50,000-99,999 POPULATION	3.49
100,000-249,999 POPULATION	3.51
250,000-999,999 POPULATION	3.49
1 MILLION + POPULATION	3.46

$F. = 1.81$, $P = .06$

REGION

	MEAN
NORTHEAST	3.56
NORTHCENTRAL	3.56
SOUTH	3.73
ROCKY MOUNTAIN	3.40
PACIFIC	3.28
ALASKA	3.03

$F. = 46.17$, $P = \leq .0001$

* THE LOWER THE SCORE, THE GREATER THE SPECIES PREFERENCE. THE OVERALL SAMPLE MEAN = 3.54 .

TABLE 22

HIGHEST AND LOWEST RANKING DEMOGRAPHIC GROUPS ON SPECIES PREFERENCE SCALE*

MOST POSITIVE	MEAN	LEAST POSITIVE	MEAN
ALASKA	3.03	76 + YEARS OLD	4.02
GRADUATE SCHOOL EDUCATION	3.11	<6TH GRADE EDUCATION	3.91
STUDENT	3.24	BLACK	3.90
PACIFIC COAST	3.28	6-8TH GRADE EDUCATION	3.89
$35,000-49,999 ANNUAL INCOME	3.29	FARMERS	3.80
$50,000 + ANNUAL INCOME	3.32	66-75 YEARS OLD	3.78
$20,000-24,999 ANNUAL INCOME	3.32	SOUTH	3.73
SOME COLLEGE	3.35	<$5,000 ANNUAL INCOME	3.72
PROFESSIONALS	3.36	9-11TH GRADE EDUCATION	3.70
CRAFTSMEN	3.36		

*THE LOWER THE MEAN SCORE, THE GREATER THE SPECIES PREFERENCE.

ing animal species. These included:

1. Aesthetics
2. Intelligence of the animal
3. Phylogenetic relatedness to human beings
4. Size of the animal
5. Economic value of the animal
6. Perceived dangerousness to human beings
7. Likelihood of inflicting property damage
8. Cultural and Historical importance
9. Animal relationship to human society (e.g., pet, farm animal, game, pest, native vs. exotic animal)
10. Predatory tendencies
11. Skin texture and morphological structure
12. Locomotion characteristics (e.g., aquatic, aerial, crawling, walking, etc.)

These factors represent a hypothetical model requiring further testing and analysis. Nonetheless, one could postulate an animal likely to inspire dislike or fear among humans might be small, unattractive, primitive, of limited cognitive capacity, capable of inflicting human injury or property damage, predatory, culturally and historically repugnant, non-native, oily or slimy, common to wet and dark places, tending to crawl or squirm about, and of negative economic value.

BASIC ATTITUDES TOWARD ANIMALS

A typology of attitudes toward animals was developed to identify people's basic values and perceptions of animals (Table 23).* These attitudes reflect patterned feelings, ideas and beliefs and, in most cases, considerably influence individual action and activities. It is important to recognize, however, that attitudes describe basic perceptions and not behaviors. Moreover, the attitudes should not be identified with individual people or groups -- i.e., the attitudes often describe elements of a person or group's perceptions of animals, but not all aspects. Instead, individuals and groups are usually characterized by a variety of attitudes although, in nearly all cases, these attitudes are hierar-

*More detailed definitions of the attitude types can be found in "Contemporary Values of Wildlife in American Society", by S.R. Kellert, published in W. Shaw and I. Zube, eds., Assessing and Categorizing Wildlife Values, 1980.6

TABLE 23

ATTITUDES TOWARD ANIMALS

NATURALISTIC:	PRIMARY INTEREST AND AFFECTION FOR WILDLIFE AND THE OUTDOORS.
ECOLOGISTIC:	PRIMARY CONCERN FOR THE ENVIRONMENT AS A SYSTEM, FOR INTERRELATIONSHIPS BETWEEN WILDLIFE SPECIES AND NATURAL HABITATS.
HUMANISTIC:	PRIMARY INTEREST AND STRONG AFFECTION FOR INDIVIDUAL ANIMALS, PRINCIPALLY PETS.
MORALISTIC:	PRIMARY CONCERN FOR THE RIGHT AND WRONG TREATMENT OF ANIMALS, WITH STRONG OPPOSITION TO EXPLOITATION OR CRUELTY TOWARDS ANIMALS.
SCIENTISTIC:	PRIMARY INTEREST IN THE PHYSICAL ATTRIBUTES AND BIOLOGICAL FUNCTIONING OF ANIMALS.
AESTHETIC:	PRIMARY INTEREST IN THE ARTISTIC AND SYMBOLIC CHARACTERISTICS OF ANIMALS.
UTILITARIAN:	PRIMARY CONCERN FOR THE PRACTICAL AND MATERIAL VALUE OF ANIMALS OR THE ANIMAL'S HABITAT.
DOMINIONISTIC:	PRIMARY INTEREST IN THE MASTERY AND CONTROL OF ANIMALS TYPICALLY IN SPORTING SITUATIONS.
*NEGATIVISTIC:	PRIMARY ORIENTATION AN ACTIVE AVOIDANCE OF ANIMALS DUE TO INDIFFERENCE, DISLIKE OR FEAR.

*HYPOTHETICALLY, THE NEGATIVISTIC ATTITUDE CAN BE DIVIDED INTO 2 ATTITUDE TYPES: A NEUTRALISTIC ATTITUDE REFLECTING A PASSIVE AVOIDANCE OF ANIMALS DUE TO INDIFFERENCE; AND, A NEGATIVISTIC ATTITUDE CHARACTERIZED BY DISLIKE AND FEAR OF ANIMALS. IN THIS RESEARCH, ONLY ONE ENCOMPASSING ATTITUDE HAS BEEN CONSIDERED.

chically evident in terms of primary, secondary and tertiary importance. A postulated relationship between attitude types and typical wildlife values and common behavioral expressions are indicated in Table 24.

Attitude scales were developed based on 9 separate questions and the scale construction process is described in Appendix 1. Additionally, a far more thorough description will be provided in a future methodological report. Eight relatively valid and reliable scales were obtained, with only the aesthetic attitude not yielding an adequate empirical measure. The independence of the 8 scales was partially demonstrated by 14 scale intercorrelations under .20, and only two greater than .40 (the naturalistic and negativistic scales, -.42; and, the naturalistic and ecologistic, +.40).

The scales are admittedly crude approximations of the underlying attitude types, and only in the broadest sense measure their true prevalence and distribution. Nevertheless, the relative frequency or "popularity" of the attitudes in the American population was estimated by standardizing the various scale scores on a 0 to 1 basis, computing a scale mean, and plotting a regression line and slope through the distribution of scores of the national sample on each of the attitude scales.*

The results of this analysis are indicated in Figure 7 and suggest the most common attitudes toward animals are, by far, the humanistic, moralistic, utilitarian and negativistic attitudes. All four had considerably lower slope figures, higher means, and were more frequently distributed (particularly the humanistic) at the higher scoring ranges. The greater prevalence of these four attitudes in the national sample provided some understanding of the conflicts existing among Americans today in their perceptions and relationships to animals. This was especially evident when one compared the basic perspectives of the moralistic and utilitarian attitudes, where a fundamental difference centers around the perceived right of humans to exploit animals. Specifically, the moralistic attitude opposes most exploitative uses of animals, particularly where death or presumed suffering are involved (e.g., hunting, trapping or laboratory experimentation), whereas the utilitarian attitude typically supports such activities if substantial human benefits results.

*Historical changes in the occurrence of these attitudes in the United States during the past 75 years will be discussed in another report.

Table 24

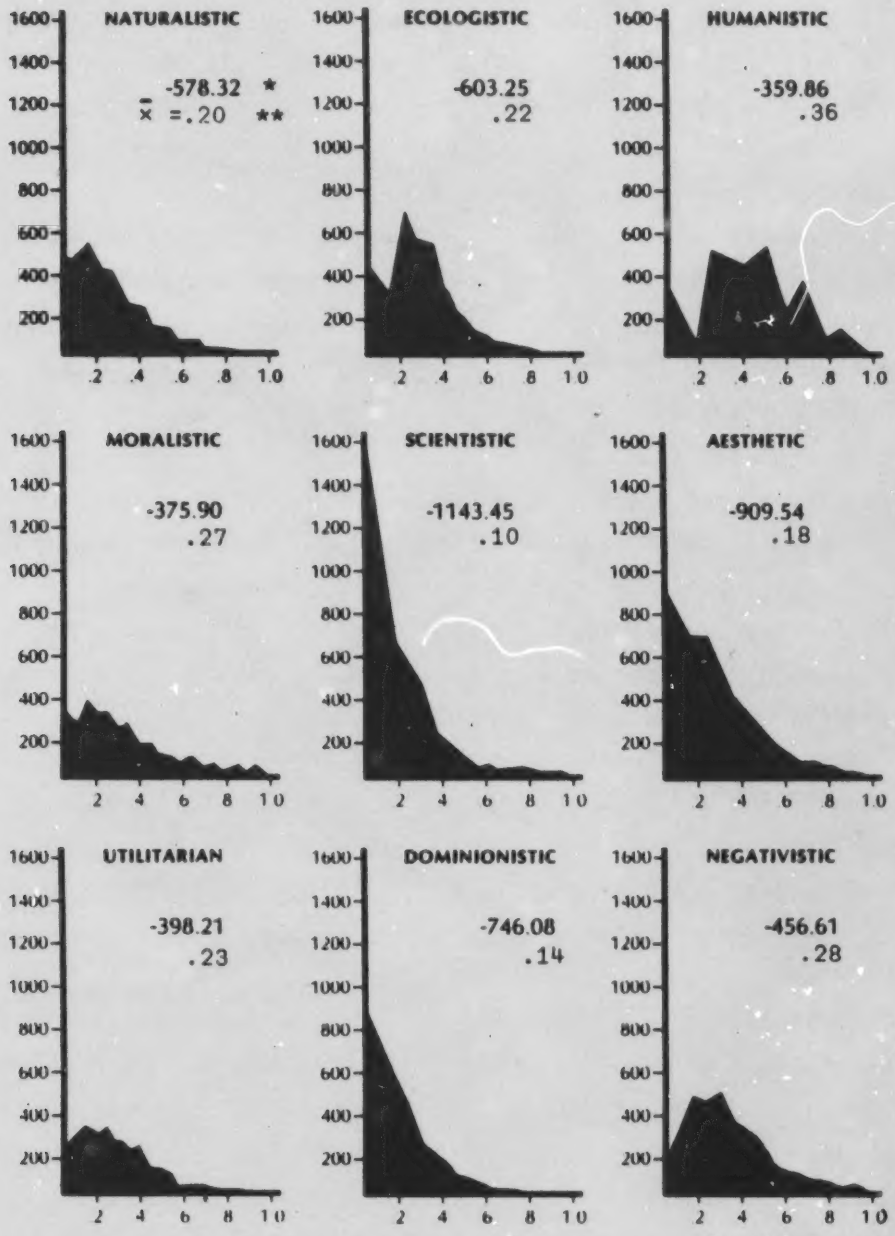
POSTULATED ATTITUDE OCCURRENCE IN AMERICAN SOCIETY

Attitude	Estimated % of American Population Strongly Oriented Towards the Attitude*	Common Behavioral Expressions	Most Related Values/Benefits
Naturalistic	10%	outdoor wildlife related recreation -- backcountry use, nature birding and nature hunting	recreational
Ecologistic	7%	conservation support, activism and membership, ecological study	ecological
Humanistic	35%	pets, wildlife tourism, casual zoo visitation	companionship, affective
Moralistic	20%	animal welfare support/membership, kindness to animals	ethical, existence
Scientistic	1%	scientific study/hobbies, collecting	scientific
Aesthetic	15%	nature appreciation, art, wildlife tourism	aesthetic
Utilitarian	20%	consumption of furs, raising meat, bounties, meat hunting	consumptive, utilitarian
Dominionistic	3%	animal spectator sports, trophy hunting, animal training	sporting
Negativistic	2%	cruelty, overt fear behavior	little or negative
Neutralistic	35%	avoidance of animal behavior	little or negative

*Totals more than 100% as persons can be strongly oriented toward more than one attitude.

Figure 7

ATTITUDE DISTRIBUTION CURVES: ENTIRE POPULATION



Vertical Axis: No. of People Horizontal Axis: Score

*This figure and similar other figures on the frequency distribution tables represent the slope of the regression line which best fits the frequency curves. The lower the figure, the more horizontal the plane of the regression line and, thus, in a rough sense, the more prevalent the attitude in the population.

**Standardized scale mean scores. The higher the number, the greater the attitude orientation in the population. Nonstandardized frequency distributions and mean scores for each scale are indicated in Appendix I.

In a somewhat analogous, but generally more latent than overt fashion, the negativistic and humanistic attitudes are typically antagonistic to one another. The point of contention, however, is the degree of human affection and attachment to animals. The negativistic attitude is characterized by indifference if not dislike for animals and, as a consequence, typically the desire to avoid these creatures. The humanistic perspective, in striking contrast, is marked by strong emotions, even love, for animals, and not unusually the desire for close, intimate involvement. Thus, the greater prevalence of these four attitudes provides some dynamic insight into the widely divergent and often conflicting opinions of Americans today regarding the proper treatment and needed protection of animals.

The least prevalent attitudes, according to the results of Figure 7, were the scientistic and dominionistic attitudes. The former was especially rare and seemed to reflect the highly intellectualized interests of a very small segment of the American population. The dominionistic attitude, on the other hand, seemed to be mildly present among a much larger group of people, but infrequently evident for the great majority of Americans.

At intervening levels of occurrence were the naturalistic and ecologistic attitudes. The shape of the naturalistic frequency distribution curve suggested an attitude strongly present among a minority of Americans, but weakly evident in most people. On the other hand, the ecologistic attitude was modestly present among a substantial proportion of the respondents, but rarely manifest in a highly committed fashion.

Additional insight regarding the relative frequency of the attitude types can be provided by examining results for a number of specific attitude questions used in each of the attitude scales. For example, the results of two naturalistic attitude questions, indicated in Table 25, suggest limited interest in invertebrates, or desire for direct contact with wilderness and the outdoors among the majority of Americans. On the other hand, these results also indicated such natturalistic concerns are evident among a substantial minority of the public. Specifically, nearly two-thirds of the national sample reported they would prefer staying in developed campgrounds than in isolated areas in close proximity to wildlife. However, 36% of the population disagreed with this notion and 30% from a moderate to strong degree. Similarly, nearly 60% of the sample disagreed most insects are fascinating, although 41% (7% strongly) agreed.

The less prevalent occurrence of the ecologistic attitude was suggested by 75%

TABLE 25 ILLUSTRATIVE NATURALISTIC SCALE QUESTIONS*

STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	STRONGLY DISAGREE	MEAN

IF I WERE GOING CAMPING, I WOULD PREFER STAYING IN A MODERN CAMPGROUND THAN IN AN ISOLATED SPOT WHERE THERE MIGHT BE WILD ANIMALS AROUND.**

(657)	(611)	(271)	(145)	(402)	(362)	3.00
26.8	24.9	11.0	5.9	16.4	13.3	
	63		36			
				Z = 12.87, P = ≤.0001		

I FIND MOST INSECTS FASCINATING.

(175)	(498)	(336)	(281)	(728)	(403)	3.87
7.1	20.3	13.7	11.5	29.6	16.4	
	41		58			
				Z = 8.19, P = ≤.0001		

TABLE 26 ILLUSTRATIVE ECOLOGISTIC SCALE QUESTIONS

STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	STRONGLY DISAGREE	MEAN

I KNOW LITTLE ABOUT ECOSYSTEMS OR THE POPULATION DYNAMICS OF WILD ANIMALS.

(424)	(1145)	(282)	(190)	(200)	(69)	2.48
17.3	46.6	11.5	7.7	8.2	2.8	
	75		19			
				Z = 28.96, P = ≤.0001		

I CARE MORE ABOUT THE SUFFERING OF INDIVIDUAL ANIMALS THAN I DO ABOUT SPECIES POPULATION LEVELS.

(249)	(760)	(419)	(281)	(419)	(181)	3.18
10.2	30.9	17.1	11.5	17.1	7.4	
	58		36			
				Z = 11.38, P = ≤.0001		

*NO OPINION RESPONSE EXCLUDED FROM ILLUSTRATIVE SCALE QUESTION TABLES. **MANY OTHER QUESTIONS WERE USED IN THIS AND THE OTHER SCALES BUT ARE NOT INCLUDED IN THIS PRESENTATION.

of the sample reporting little concern for ecosystems or the population dynamics of wild animals. Additionally, nearly 60 percent of the public said they cared more about the suffering of individual animals than species population levels (Table 26).

The relative popularity of the humanistic attitude was evident in the finding of 86% of the public disagreeing that love is an emotion people should feel for people and not for animals. Moreover, two-thirds reported owning pets as dear to them as another person (Table 27).

The strength of the moralistic perspective was suggested by over three-fourths of the public objecting to the use of the steel leg-hold trap and endorsing more natural habitat conditions for zoo animals even at the expense of much higher entrance fees (Table 28). On the other hand, the rarity of the scientistic attitude was suggested by nearly two-thirds reporting little interest in learning about the taxonomic characteristics of animals or in studying vertebrate zoology (Table 29).

The relative importance of the utilitarian attitude was reflected in a number of findings. For example, 39% approved of building housing projects on wetlands to the detriment of local waterfowl, and solid majorities supported a variety of water diversion and damming projects for agricultural, drinking and energy development purposes even if they threatened the survival of an unknown fish species. At a more subjective level, 37% agreed that a dog trained to perform practical tasks was, generally speaking, better than one owned just for companionship (Table 30 and Figure 6, refer to page 33).

The infrequency of the dominionistic attitude was suggested by 77% of the national sample denying admiration for a person who hunts hard to obtain a large trophy animal. Additionally, most disagreed that horses or dogs need beatings to train them to obey orders more properly (Table 31).

Finally, the relative popularity of the negativistic attitude was reflected in various results, particularly those involving perceptions of invertebrates or animals associated with human injury or disease. For example, over 70% of the national sample said they disliked most beetles and spiders; 80% thought rats and cockroaches should be eliminated; and 60% reported being afraid to touch a snake (Table 32).

Distribution of the attitudes among various demographic and animal-related activity groups was also examined. The latter results have been described in a previous paper and, therefore, are only summarized in tabular form in Appendix 5.[7] On

TABLE 27 ILLUSTRATIVE HUMANISTIC SCALE QUESTIONS

STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	STRONGLY DISAGREE	MEAN

I THINK LOVE IS AN EMOTION WHICH PEOPLE SHOULD FEEL ONLY FOR OTHER PEOPLE, NOT FOR ANIMALS.

(73)	(133)	(114)	(181)	(872)	(1056)	4.98
3.0	5.4	4.6	7.4	35.5	43.0	
	13		86			
				Z = 36.30, P = ≤ .0001		

I HAVE OWNED PETS THAT WERE AS DEAR TO ME AS ANOTHER PERSON.

(613)	(703)	(292)	(184)	(430)	(196)	2.88
25.0	28.6	11.9	7.5	17.5	8.0	
	66		33			
				Z = 16.27, P = ≤ .0001		

TABLE 28 ILLUSTRATIVE MORALISTIC SCALE QUESTIONS

STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	STRONGLY DISAGREE	MEAN

I SEE NOTHING WRONG WITH USING STEEL TRAPS TO CAPTURE WILD ANIMALS.

(56)	(244)	(151)	(240)	(723)	(958)	
2.3	10.0	6.1	9.8	29.5	39.0	
	18		78			
				Z = 30.18, P = ≤ .0001		

ZOOS SHOULD PROVIDE MORE NATURAL CONDITIONS FOR THEIR ANIMALS EVEN IF THIS MEANS MUCH HIGHER ENTRANCE FEES.

(600)	(1257)	(314)	(102)	(110)	(25)	
24.5	51.2	12.8	4.2	4.5	1.0	
	89		10			
				Z = 39.41, P = ≤ .0001		

TABLE 29 ILLUSTRATIVE SCIENTISTIC SCALE QUESTIONS

STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	STRONGLY DISAGREE	MEAN

I HAVE LITTLE DESIRE TO STUDY VERTEBRATE ZOOLOGY OR POPULATION GENETICS.

(478)	(824)	(262)	(255)	(313)	(198)	2.87
19.5	33.6	10.7	10.4	12.7	8.1	
	64		31			
			$Z = 16.53$, $P = \leq .0001$			

I HAVE LITTLE INTEREST IN LEARNING ABOUT THE TAXONOMIC CLASSIFICATION OF ANIMALS.

(359)	(923)	(290)	(232)	(307)	(118)	2.80
14.6	37.6	11.8	9.5	12.5	4.8	
	64		27			
			$Z = 19.38$, $P = \leq .0001$			

TABLE 30 ILLUSTRATIVE UTILITARIAN SCALE QUESTIONS

STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	STRONGLY DISAGREE	MEAN

A DOG TRAINED AT A TASK, LIKE HERDING SHEEP, IS GENERALLY A BETTER DOG THAN ONE OWNED JUST FOR COMPANIONSHIP.

(141)	(490)	(275)	(328)	(846)	(284)	3.89
5.7	19.9	11.2	13.4	34.5	11.5	
	37		59			
			$Z = 11.35$, $P = \leq .0001$			

I APPROVE OF BUILDING ON MARSHES THAT DUCKS AND OTHER NON-ENDANGERED WILDLIFE USE IF THE MARSHES ARE NEEDED FOR HOUSING DEVELOPMENT.

(65)	(486)	(405)	(309)	(715)	(365)	3.95
2.6	19.8	16.5	12.6	29.1	14.9	
	39		57			
			$Z = 8.94$, $P = \leq .0001$			

TABLE 31
ILLUSTRATIVE DOMINIONISTIC SCALE QUESTIONS

I ADMIRE A PERSON WHO WORKS HARD TO SHOOT A BIG TROPHY ANIMAL LIKE A 600-POUND BEAR.

STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	STRONGLY DISAGREE	MEAN
(90)	(227)	(194)	(197)	(781)	(905)	4.70
3.7	9.2	7.9	8.0	31.8	36.9	
	21			77	$Z = 28.04$, $P = \leq .0001$	

I THINK A PERSON SOMETIMES HAS TO BEAT A HORSE OR DOG TO GET IT TO OBEY ORDERS PROPERLY.

(42)	(175)	(220)	(191)	(823)	(971)	4.85
1.7	7.1	9.0	7.8	33.5	39.6	
	18			81	$Z = 31.46$, $P = \leq .0001$	

TABLE 32

ILLUSTRATIVE NEGATIVISTIC SCALE QUESTIONS

I DISLIKE MOST BEETLES AND SPIDERS.

STRONGLY AGREE	AGREE	SLIGHTLY AGREE	SLIGHTLY DISAGREE	DISAGREE	STRONGLY DISAGREE	MEAN
(607)	(850)	(283)	(197)	(350)	(140)	
24.7	34.6	11.5	8.0	14.2	5.7	2.69
	71		28		Z = 21.38, P = ≤.0001	

I WOULD BE AFRAID TO TOUCH A SNAKE.

(761)	(484)	(229)	(191)	(469)	(316)	
31.0	19.7	9.3	7.8	19.1	12.9	3.03
	60		40		Z = 10.06, P = ≤.0001	

I THINK RATS AND COCKROACHES SHOULD BE ELIMINATED.

(1175)	(605)	(172)	(122)	(188)	(176)	
47.9	24.6	7.0	5.0	7.7	7.2	2.21
	80		20		Z = 29.69, P = ≤.0001	

the other hand, attitudes among various demographic groups are reviewed in two ways. First, differences among categories of individual demographic variables -- e.g., between varying age or socioeconomic groups -- are examined. This is then followed by a comparison of all demographic groups on each of the attitude scales. Ten demographic variables were examined including age, sex, race, education, income, occupation, urban/rural residence, region, participation in religious activities and, limitedly, marital status. In addition, population of childhood residence and property ownership were briefly explored, as well as disciplinary concentration among those who had a college education. A number of other demographic factors are not reviewed in this report, although information exists on respondents differentiated according to nationality, American Indian and Spanish-American heritage, service in the armed forces, religious preference, presidential voting behavior, number of children and parents occupation.

AGE

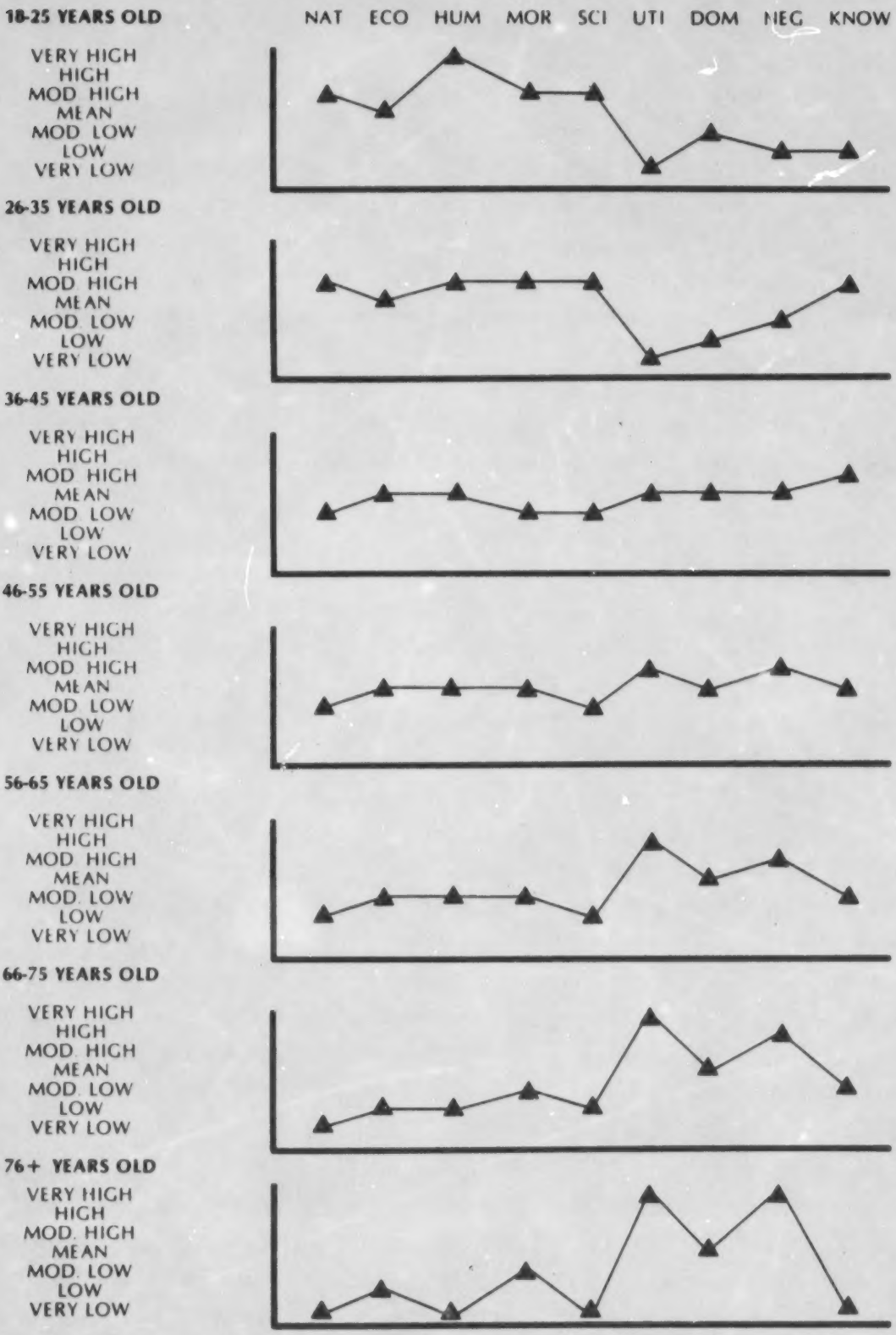
Attitude scale results in Figure 8 and Table 33 indicate some striking differences among varying age groups, particularly between the oldest and youngest respondents. Specifically, those under 25 appeared to be more appreciatively and affectionately oriented toward animals, particularly wildlife, and more concerned about their protection and less utilitarian oriented than persons 76 years of age and older.

Humanistic and naturalistic scale results were particularly striking, often proceeding from more to less affection for pets and wildlife with increasing age. Differences were especially significant on the humanistic scale with persons under 25 having higher humanistic scores than any demographic group in the entire study, while those over 76 had among the lowest scores. This difference was further reflected in negativistic scale results with, again, a roughly linear trend toward higher negativistic scores with increasing age. Very high negativistic scores were particularly characteristic of respondents over 75; indeed, only exceeded by those with less than a sixth grade education of all groups examined in the study.

Striking differences among varying age groups in protectionist concern for animals and, conversely, the willingness to exploit wildlife, were reflected in highly significant moralistic and utilitarian scale results. Variations again tended to be linear and most extreme when comparing the two poles of the age continuum. Utilitarian results were especially great with respondents over 66 scoring only

Figure 8

AGE GROUPS BY SELECTED KNOWLEDGE AND ATTITUDE SCALES*



*A description of how the qualitative scoring categories (i.e., "very high to very low") were developed is provided on page 60.

TABLE 33

ANALYSIS OF VARIANCE AND MULTIPLE CLASSIFICATION ANALYSIS FOR AGE X ATTITUDE AND KNOWLEDGE SCALES*

	DEVIATION FROM GRAND MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES				
	18-25	26-35	36-55	56-75	76 +
NATURALISTIC SIG. OF F = .000	0.52	0.36	-0.09	-0.54	-0.49
ECOLOGISTIC SIG. OF F = .039	0.07	0.10	0.12	-0.29	-0.08
HUMANISTIC SIG. OF F = .000	0.71	0.16	-0.15	-0.37	-0.67
MORALISTIC SIG. OF F = .010	0.44	0.49	-0.32	-0.30	-0.53
SCIENTISTIC SIG. OF F = .000	0.30	0.28	0.10	-0.30	-0.38
UTILITARIAN SIG. OF F = .000	-1.14	-0.88	0.26	1.15	1.43
DOMINIONISTIC SIG. OF F = .411	-0.08	-0.05	0.11	-0.08	0.22
NEGATIVISTIC SIG. OF F = .000	-0.69	-0.45	0.25	0.50	0.74
KNOWLEDGE SIG. OF F = .000	-2.30	-0.49	0.84	1.57	-3.12

*Multiple classification analysis is a statistical technique based on analysis of variance which allows one to determine how much particular categories of a variable are different from the overall population mean adjusted for the effects of other variables. In other words, this technique allows us to determine which categories of a variable contribute the most to the overall significance of the variable -- e.g., which specific age or educational groups are most related to a particular scale after other variables have been taken into account.

lower than farmers and persons with less than an eighth grade education among demographic groups. The likelihood of these age differences being more a function of attitudes toward animal exploitation and concern for the ethical treatment of animals, than toward human impacts on natural habitats and wildlife, was implied by more impressive utilitarian and moralistic than ecologistic scale results.

Relatedly, attitudes toward a number of specific wildlife management issues varied greatly. Those under 25, for example, were far more willing to incur diverse socioeconomic impacts for the sake of protecting endangered or threatened wildlife. Additionally, participation in nearly all animal-related activities was substantially higher among younger than older respondents, particularly backpacking, scientific study, zoo and natural history museum visitation, off-road vehicle use, membership in environmental protection organizations, environmental activism and hunting (Figure 9).

Ironically, despite these considerable differences, the knowledge scores of those under 25 and over 76 were remarkably similar, with both groups scoring considerably below the general population mean.

Data collected at one point in time precludes confident statements about long-term trends, because of the inability to determine if age group variations reflect maturational shifts as individuals progress through the life-cycle or substantive changes in society over time. Regarding attitudes toward animals, one would suspect both forces have been at work, with a tendency toward an increasingly utilitarian perspective of animals as individuals assume greater family and work responsibilities while, at the same time, a more urbanized and affluent society stimulating increasing appreciation and concern for animals.

While certainly not a test of the historical change hypothesis, some insight can be obtained by examining the relationship between age, marital status and the attitude scales. For example, if marriage implies increasing responsibilities, one might expect greater utilitarian and, perhaps, less moralistic sentiments among married compared to single respondents after controlling for age. In fact, as Table 34 reveals, after controlling for marital status, age variations remained highly significant on both the utilitarian and moralistic scales. While the value of this analysis is tenuous, it adds credibility to the proposition that age differences reflect real and substantive changes in our society's perceptions of animals.

Figure 9

AGE CHARACTERISTICS OF SELECTED ANIMAL ACTIVITY GROUPS

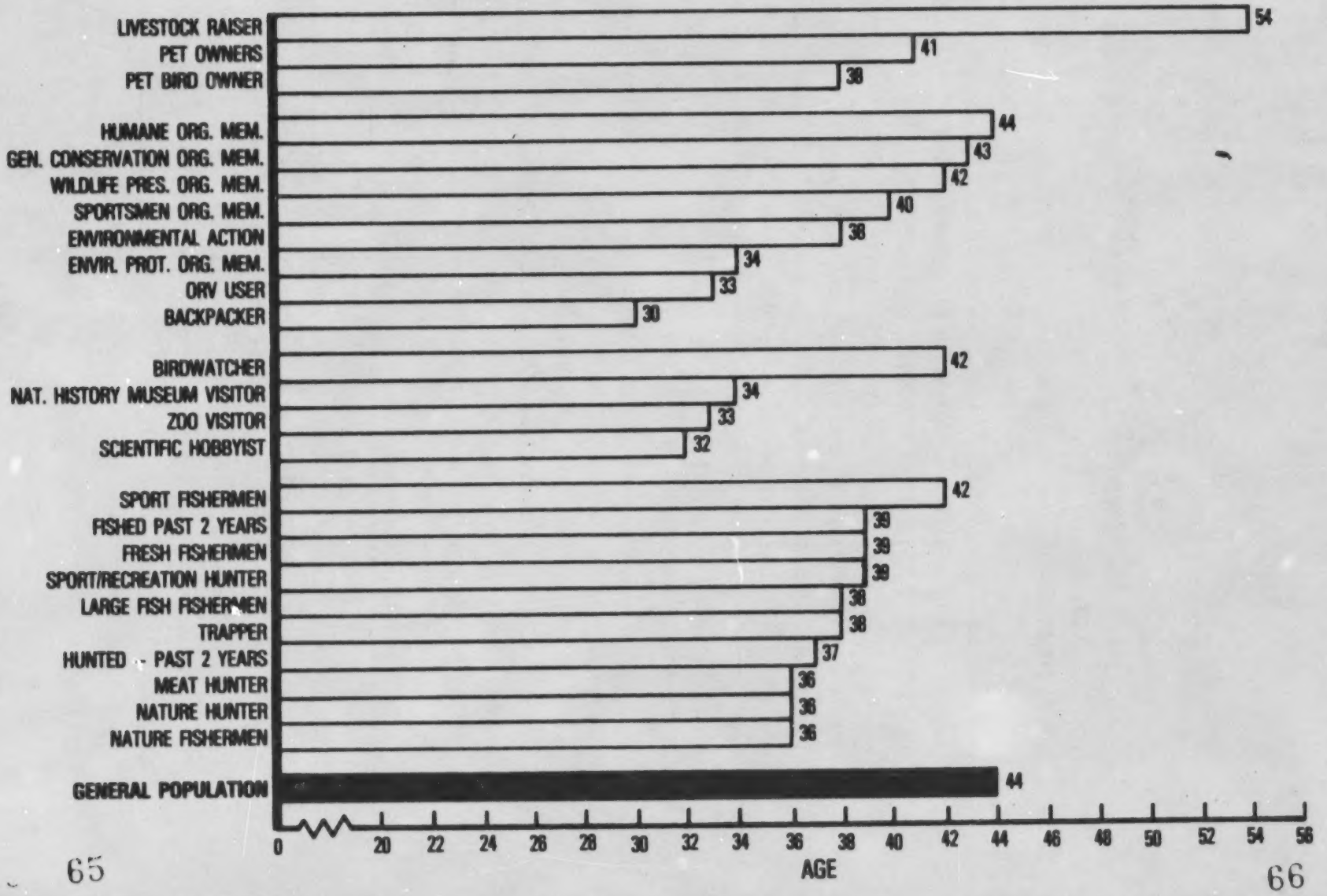


TABLE 34A
% AGE X MORALISTIC SCALE X MARRIED*

	LOW MORALISTIC 1	2	3	4	HIGH MORALISTIC 5
18 TO 35	14.6%	22.5	17.5	24.4	21.0
36 TO 55	22.2	23.0	18.1	21.2	15.5
56 TO 75	23.0	25.5	15.2	23.1	13.4
76 +	38.4	13.0	23.8	20.5	4.3

$X^2 = 34.17$, $P = .0006$

*NUMBER OF MARRIED RESPONDENTS IN 2455 SAMPLE = 1569

TABLE 34B
% AGE X UTILITARIAN SCALE X MARRIED*

	LOW UTILITARIAN 1	2	3	4	HIGH UTILITARIAN 5
18 TO 35	23.3%	24.5	18.2	22.0	12.0
36 TO 55	13.9	18.5	20.0	28.4	19.2
56 TO 75	9.0	14.5	16.3	26.6	33.6
76 +	9.8	9.8	19.5	16.8	44.1

$X^2 = 112.74$, $P = \leq .0001$

*NUMBER OF MARRIED RESPONDENTS IN 2455 SAMPLE = 1569

SEX

Male/female differences in attitudes and knowledge of animals were substantial and implied the need for better understanding and appreciation of female attitudes toward and interests in wildlife (Figure 10 and Table 35). Particularly provocative were variations in basic feelings and ethical concern for animals.

The most outstanding result was the much greater humanistic concern for animals among females. Indeed, after adjusting for other demographic factors, females were only exceeded by those with high incomes and respondents under 25 in humanistic concern for animals, while males were among the lowest scoring on this scale. On the other hand, greater general interest in animals, particularly for wildlife, was found among males, as reflected in much higher naturalistic and lower negativistic scale scores. Additionally, males revealed significantly greater knowledge of animals than did females.

It appeared, thus, that males possessed a more generalized interest and understanding of animals, but in a somewhat emotionally detached and matter-of-fact manner not found among females. This was also suggested by a greater willingness among males to use and dominate animals for practical or recreational purposes, as reflected in significantly higher utilitarian and dominionistic scale scores.

A highly protectionist attitude toward animals among females was indicated by very high moralistic scale scores, both in relation to males and other demographic groups. Relatedly, females were significantly more opposed to hunting, as well as to a variety of other consumptive uses of animals.

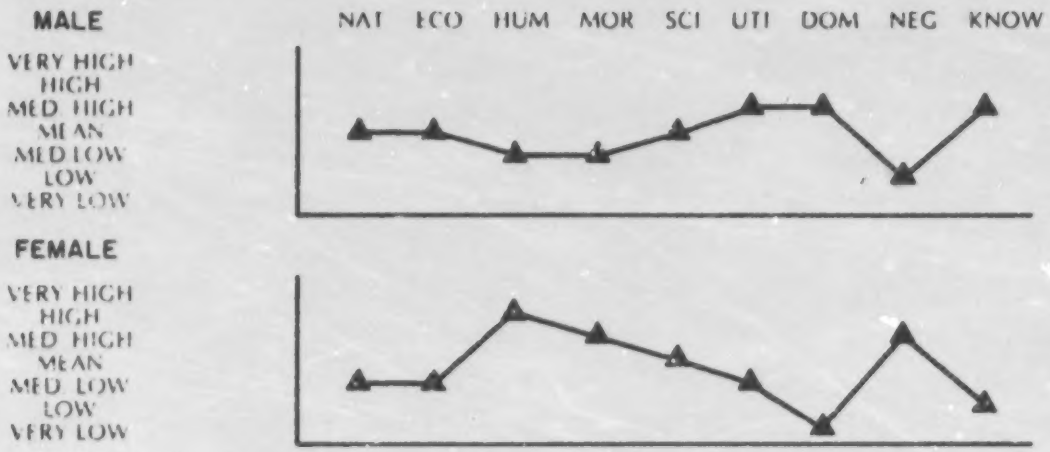
Pronounced differences in male/female attitudes, knowledge and behavioral relations (Figure 11) to animals suggested important divergencies in interest and concern for animals among the sexes. Indeed, such differences provide some understanding of why the sexes appear to be unequally allied with opposing groups on such controversies as the use of steel leg-hold traps, the management of wild free-roaming horses and burros, and the killing of baby seals. It may be increasingly necessary, thus, for wildlife managers to show greater cognizance and understanding of the concerns and attitudes of many female wildlife enthusiasts, as well as a better appreciation of female activity interests through more appropriately tailored outdoor recreational opportunities.

RACE

A number of important white/non-white differences were observed on the attitude scales and remained highly significant after various attempts to account for

FIGURE 10

SEX BY SELECTED KNOWLEDGE AND ATTITUDE SCALES *



*QUALITATIVE SCORING CATEGORIES (I.E., "VERY HIGH TO VERY LOW") WERE DETERMINED BASED ON THE RELATIVE NUMERICAL SCALE SCORES OF SOME 97 DEMOGRAPHIC AND ANIMAL-RELATED ACTIVITY GROUPS. THE HIGHEST AND LOWEST CATEGORIES WERE DETERMINED FIRST WITH THE RANGE BETWEEN THESE TWO EXTREME VALUES THEN DIVIDED INTO 5 ROUGHLY EQUAL SEGMENTS (I.E., EQUAL IN TERMS OF THE NUMBER OF GROUPS INCLUDED IN THE CATEGORY, NOT IN THE SCORING RANGES COVERED). FINALLY, THE NUMERICAL VALUES OF THESE CATEGORIES WERE TRANSLATED INTO CORRESPONDING QUALITATIVE TERMS.

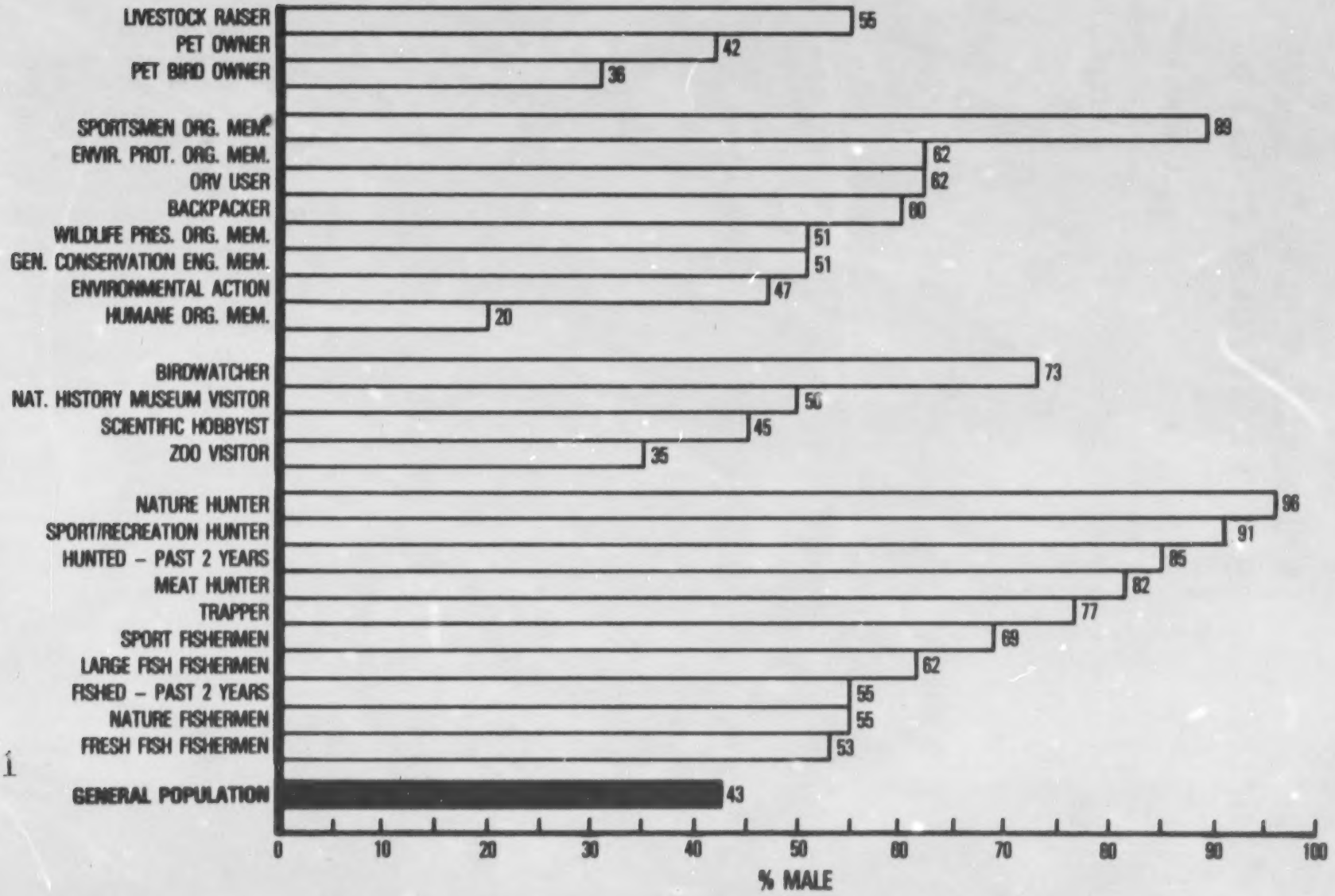
TABLE 35

ANALYSIS OF VARIANCE AND MULTIPLE CLASSIFICATION ANALYSIS FOR SEX X ATTITUDE AND KNOWLEDGE SCALES

	SIG. F	DEVIATION FROM GRAND MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES	
NATURALISTIC	.000	MALE	0.29
		FEMALE	-0.22
ECOLOGISTIC	.000	MALE	0.27
		FEMALE	-0.20
HUMANISTIC	.000	MALE	-0.45
		FEMALE	0.33
MORALISTIC	.000	MALE	-0.86
		FEMALE	0.64
SCIENTISTIC	.218	MALE	0.04
		FEMALE	-0.03
UTILITARIAN	.000	MALE	0.48
		FEMALE	-0.36
DOMINIONISTIC	.000	MALE	0.68
		FEMALE	-0.51
NEGATIVISTIC	.000	MALE	-0.68
		FEMALE	0.51
KNOWLEDGE	.000	MALE	2.18
		FEMALE	-1.62

FIGURE 11

PERCENT MALE OF SELECTED ANIMAL ACTIVITY GROUPS



the possibly confounding effects of other factors. The most outstanding results were on dimensions involving interest, knowledge and concern for wildlife and natural habitats. In most cases, the results were largely attributable to the scores of black respondents, whereas those of whites were generally not especially different from the overall population mean (Figure 12 and Table 36).

Far less interest and concern for wildlife and natural habitats among blacks were revealed in exceptionally low naturalistic, knowledge and very high negativistic scale scores. Indeed, after adjusting for the effects of other demographic factors, negativistic, naturalistic and knowledge scores among blacks were the most unusual of any demographic group examined in the study.

These differences were so great, that in addition to analysis of variance and multiple classification analysis tests, it seemed prudent to further explore the confounding effects of other demographic factors, particularly socioeconomic status, by performing a series of three-way cross tabulations. This analysis was paticularly revealing and, in general, corroborated the significance of race but, primarily, at the middle to higher end of the socioeconomic spectrum.* Specifically, black/white differences on the naturalistic scale were highly significant for those with a college education, but not so for respondents with a high school diploma or less (Table 37). In other words, less educated respondents, regardless of race, were characterized by limited naturalistic interest in animals, although among the college educated, whites were much more oriented toward wildlife and the out-of-doors. A similar pattern was evident when controlling for income with non-significant naturalistic differences among black and white very poor respondents (i.e., earning less than $5,000 income), but highly significant at all other income levels (Table 38).

A somewhat analogous result occurred on the negativistic scale with black/white differences remaining highly significant at the high school and $5,000 income levels and above, although inconsequential among respondents who had less than a sixth grade education and earned less than $5,000 income (Tables 39-40). Additionally, non-significant white/black knowledge differences were found among respondents with less than an 11th grade education, although quite significantly different at the high school level and above (Table 41).

Thus, race appeared to be a very important demographic factor on the naturalistic, negativistic and knowledge dimensions, although primarily among those of moderate to higher income and education. For reasons not yet clear, educated and higher income blacks did not reveal anywhere as much interest, knowledge or involvement with wildlife as did whites of similar socioeconomic status.

*It was especially notable that population of present residence had no effect on the relationship between race and the attitude and knowledge scales.

FIGURE 12

RACE GROUPS BY SELECTED KNOWLEDGE AND ATTITUDE SCALES

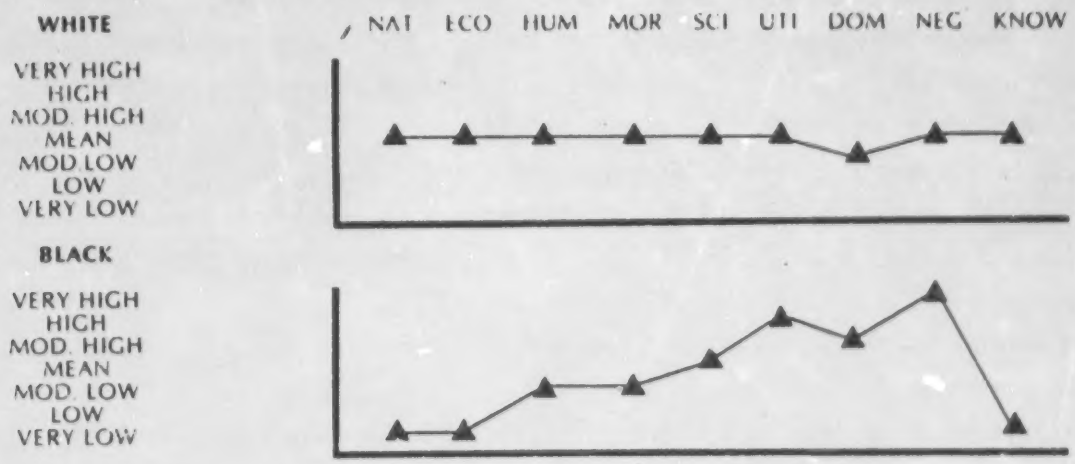


TABLE 36

ANALYSIS OF VARIANCE AND MULTIPLE CLASSIFICATION ANALYSIS FOR RACE X ATTITUDE AND KNOWLEDGE SCALES

	SIG. F	DEVIATION FROM GRAND MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES	
NATURALISTIC	.000	WHITE	0.09
		BLACK	-0.87
ECOLOGISTIC	.000	WHITE	0.06
		BLACK	-0.62
HUMANISTIC	.092	WHITE	0.03
		BLACK	-0.32
MORALISTIC	.392	WHITE	0.04
		BLACK	-0.33
SCIENTISTIC	.549	WHITE	0.00
		BLACK	-0.06
UTILITARIAN	.000	WHITE	-0.11
		BLACK	1.13
DOMINIONISTIC	.002	WHITE	-0.04
		BLACK	0.43
NEGATIVISTIC	.000	WHITE	-0.11
		BLACK	1.08
KNOWLEDGE	.000	WHITE	0.57
		BLACK	-5.50

TABLE 37A

% RACE X NATURALISTIC SCALE X HIGH SCHOOL EDUCATION*

	LOW NATURALISTIC 1	2	3	4	HIGH NATURALISTIC 5
WHITE	33.6 %	19.0	25.0	14.0	8.4
BLACK	39.6	17.4	27.0	11.1	5.0

$X^2 = 2.64$, $P = .6197$

*NUMBER OF HIGH SCHOOL EDUCATED RESPONDENTS IN 2455 SAMPLE = 945

TABLE 37B

% RACE X NATURALISTIC SCALE X COLLEGE EDUCATION*

	LOW NATURALISTIC 1	2	3	4	HIGH NATURALISTIC 5
WHITE	25.1 %	15.3	25.8	16.1	17.6
BLACK	25.8	31.9	26.4	13.4	2.5

$X^2 = 15.22$, $P = .0043$

*NUMBER OF COLLEGE EDUCATED RESPONDENTS IN 2455 SAMPLE = 686

TABLE 38A

% RACE X NATURALISTIC SCALE X $0-4,999 ANNUAL INCOME*

	LOW NATURALISTIC 1	2	3	4	HIGH NATURALISTIC 5
WHITE	35.8 %	19.7	24.0	13.7	6.8
BLACK	50.0	21.8	11.8	16.4	0.0

$X^2 = 6.45$, $P = .1682$

*NUMBER OF RESPONDENTS WITH <$5,000 INCOME IN 2455 SAMPLE = 228

TABLE 38B

% RACE X NATURALISTIC SCALE X $5,000-14,999 ANNUAL INCOME*

	LOW NATURALISTIC 1	2	3	4	HIGH NATURALISTIC 5
WHITE	33.9 %	17.9	23.2	13.0	11.9
BLACK	45.1	22.4	24.3	4.9	3.4

$X^2 = 13.31$, $P = .0099$

*NUMBER OF RESPONDENTS WITH $5,000-14,999 INCOME IN 2455 SAMPLE = 768

TABLE 38C

% RACE X NATURALISTIC SCALE X $15,000-24,999 ANNUAL INCOME*

	LOW NATURALISTIC 1	2	3	4	HIGH NATURALISTIC 5
WHITE	27.5 %	16.3	26.4	17.0	12.8
BLACK	27.3	34.8	23.8	14.0	0.0

$X^2 = 14.06$, $P = .0071$

*NUMBER OF RESPONDENTS WITH $15,000-24,999 INCOME IN 2455 SAMPLE = 662

TABLE 39A

% RACE X NEGATIVISTIC SCALE X 0 - 5 GRADE EDUCATION*

	LOW NEGATIVISTIC 1	2	3	4	HIGH NEGATIVISTIC 5
WHITE	0.8 %	6.2	31.0	24.7	37.3
BLACK	6.3	18.8	25.0	18.8	31.3

$X^2 = 2.49$, P = .6464

*NUMBER OF 0-5 GRADE RESPONDENTS IN 2455 SAMPLE = 37

TABLE 39B

% RACE X NEGATIVISTIC SCALE X HIGH SCHOOL EDUCATION*

	LOW NEGATIVISTIC 1	2	3	4	HIGH NEGATIVISTIC 5
WHITE	10.7 %	28.8	26.7	19.7	14.1
BLACK	7.7	12.5	26.4	29.6	23.8

$X^2 = 16.56$, P = .0023

*NUMBER OF HIGH SCHOOL EDUCATED RESPONDENTS IN 2455 SAMPLE = 945

TABLE 39C

% RACE X NEGATIVISTIC SCALE X COLLEGE EDUCATION*

	LOW NEGATIVISTIC 1	2	3	4	HIGH NEGATIVISTIC 5
WHITE	20.0 %	30.8	28.8	13.6	6.8
BLACK	8.4	13.7	43.1.	14.9	19.9

$X^2 = 22.49$, P = .0002

*NUMBER OF COLLEGE EDUCATED RESPONDENTS IN 2455 SAMPLE = 686

TABLE 40A

% RACE X NEGATIVISTIC SCALE X $0-4,999 ANNUAL INCOME*

	LOW NEGATIVISTIC 1	2	3	4	HIGH NEGATIVISTIC 5
WHITE	8.3 %	21.0	27.6	25.6	17.5
BLACK	8.2	10.9	24.6	21.8	34.5

$X^2 = 6.25$, $P = .1810$

*NUMBER OF RESPONDENTS WITH <$5,000 INCOME IN 2455 SAMPLE = 228

TABLE 40B

% RACE X NEGATIVISTIC SCALE X $5,000-14,999 ANNUAL INCOME*

	LOW NEGATIVISTIC 1	2	3	4	HIGH NEGATIVISTIC 5
WHITE	12.2 %	25.9	26.2	20.2	15.4
BLACK	4.7	12.9	30.8	26.8	24.8

$X^2 = 15.96$, $P = .0031$

*NUMBER OF RESPONDENTS WITH $5,000-14,999 INCOME IN 2455 SAMPLE = 768

TABLE 40C

% RACE X NEGATIVISTIC SCALE X $15,000-24,999 ANNUAL INCOME*

	LOW NEGATIVISTIC 1	2	3	4	HIGH NEGATIVISTIC 5
WHITE	18.0 %	29.8	28.9	14.1	9.2
BLACK	5.3	9.1	38.7	24.2	22.8

$X^2 = 21.66$, $P = .0002$

*NUMBER OF RESPONDENTS WITH $15,000-24,999 INCOME IN 2455 SAMPLE = 662

TABLE 41A

% RACE X KNOWLEDGE X 9 - 11 GRADE EDUCATION*

	LOW KNOWLEDGE 1	2	3	4	5	6	7	HIGH KNOWLEDGE 8
WHITE	7.4 %	9.6	17.8	17.0	18.5	17.0	11.2	1.6
BLACK	12.3	14.3	29.3	24.2	9.9	9.5	0.4	0.0

$X^2 = 13.31$, $P = .0648$

*NUMBER OF 9-11 GRADE RESPONDENTS IN 2455 SAMPLE = 336

TABLE 41B

% RACE X KNOWLEDGE X HIGH SCHOOL EDUCATION*

	LOW KNOWLEDGE 1	2	3	4	5	6	7	HIGH KNOWLEDGE 8
WHITE	6.0 %	8.6	18.3	19.4	16.4	18.1	9.1	4.1
BLACK	10.9	23.0	22.0	17.6	15.5	2.6	7.3	1.2

$X^2 = 32.46$, $P = \leq .0001$

*NUMBER OF HIGH SCHOOL EDUCATED RESPONDENTS IN 2455 SAMPLE = 945

TABLE 41C

% RACE X KNOWLEDGE X COLLEGE EDUCATION*

	LOW KNOWLEDGE 1	2	3	4	5	6	7	HIGH KNOWLEDGE 8
WHITE	3.5 %	5.6	11.5	13.8	17.8	21.9	15.3	10.6
BLACK	10.0	10.0	26.8	22.1	19.1	5.6	2.8	3.7

$X^2 = 32.37$, $P = \leq .0001$

*NUMBER OF COLLEGE EDUCATED RESPONDENTS IN 2455 SAMPLE = 686

Differences in concern for animals and their well-being among blacks and whites appeared to be largely confined to issues involving the protection of natural habitat and wildlife rather than the treatment of pets or cruelty toward animals. This was reflected in highly significant ecologistic and utilitarian scale differences, but only modest variations in either humanistic or moralistic attitudes. On the ecologistic scale, blacks had the lowest scores of any demographic group while, on the utilitarian dimension, only respondents 56 years and older and farmers had higher scores. On the other hand, non-significant differences on the moralistic and humanistic scales suggested attitudes toward various cruelty and pet issues were not important differentiators of black/white perceptions of animals. In other words, blacks appeared to be as interested as whites in domestic animals or the presumed suffering of animals, but far less oriented toward the conservation of wildlife or the out-of-doors. Additionally, far less participation in almost all wildlife related activities among non-whites was found (Figure 13).

Black/white differences may be partly attributable to varying cultural and historical experiences, as well as to the interrelationship of socioeconomic, urban/rural and racial factors in American society. In either case, they may be maintained and even fostered by inadvertent but, nevertheless, important racial inequities in management attention and concern, particularly in connection with rural versus urban and, inevitably, white versus black wildlife programs. A number of exciting possibilities for wildlife-related experiences do exist in urban areas. An expansion in urban wildlife programs could yield large dividends not only in greater non-white enjoyment of wildlife but, perhaps more importantly, in making the protection of natural habitats a more salient and relevant consideration for inner city residents.

EDUCATION

Of all demographic variables, education was the most sensitive indicator of appreciation, concern, affection, knowledge and respect for animals. Indeed, the relationship of education to attitudes and knowledge of animals was strong, direct and linear (Table 42). Moreover, as the graph in Figure 14 vividly depicts, respondents with less than a sixth grade education were very nearly the opposite of those with a graduate education in basic perceptions and understanding of animals.

Particularly pronounced were differences in general appreciation and affection for animals, particularly wildlife. Variations in naturalistic and negativistic

FIGURE 13

PERCENT WHITE OF SELECTED ANIMAL ACTIVITY GROUPS

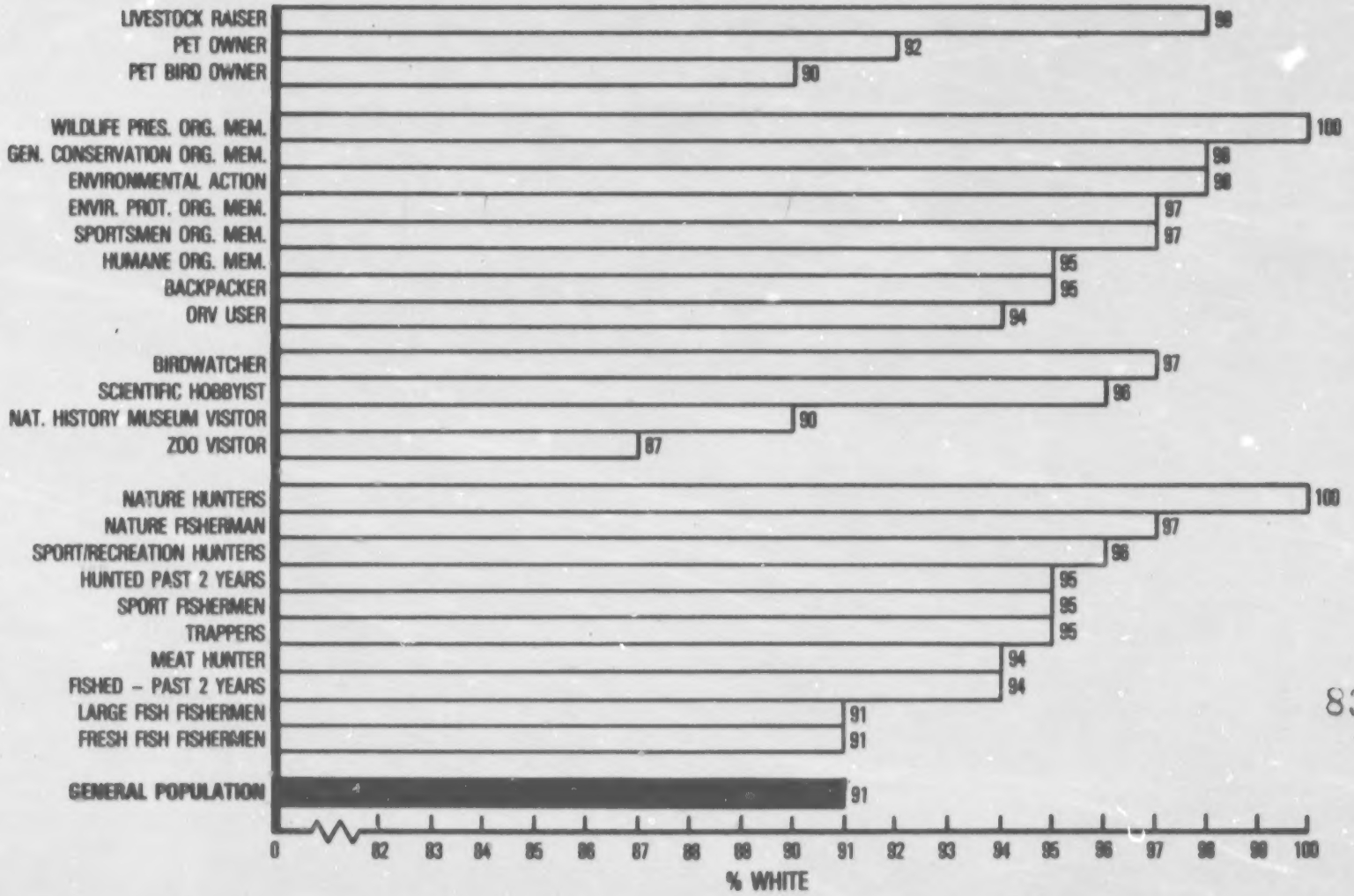

LIVESTOCK RAISER 98
PET OWNER 92
PET BIRD OWNER 90
WILDLIFE PRES. ORG. MEM. 100
GEN. CONSERVATION ORG. MEM. 98
ENVIRONMENTAL ACTION 98
ENVIR. PROT. ORG. MEM. 97
SPORTSMEN ORG. MEM. 97
HUMANE ORG. MEM. 95
BACKPACKER 95
ORV USER 94
BIRDWATCHER 97
SCIENTIFIC HOBBYIST 96
NAT. HISTORY MUSEUM VISITOR 90
ZOO VISITOR 87
NATURE HUNTERS 100
NATURE FISHERMAN 97
SPORT/RECREATION HUNTERS 96
HUNTED PAST 2 YEARS 95
SPORT FISHERMEN 95
TRAPPERS 95
MEAT HUNTER 94
FISHED - PAST 2 YEARS 94
LARGE FISH FISHERMEN 91
FRESH FISH FISHERMEN 91
GENERAL POPULATION 91
0 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
% WHITE

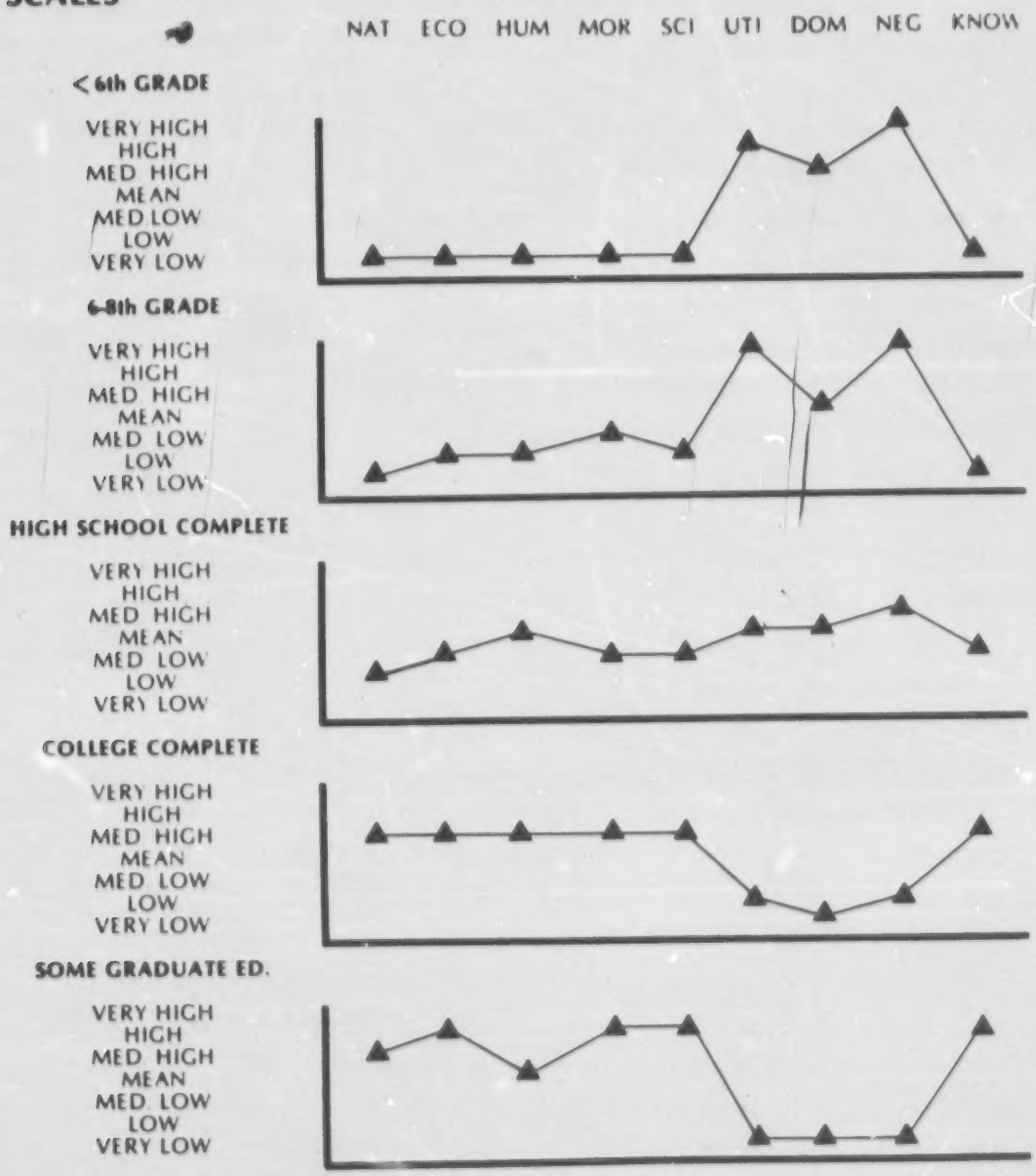
TABLE 42

ANALYSIS OF VARIANCE AND MULTIPLE CLASSIFICATION ANALYSIS FOR EDUCATION X ATTITUDE AND KNOWLEDGE SCALES

	DEVIATION FROM GRAND MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES				
	< 8TH GRADE	9-11	12TH + VOC/TECH	COLLEGE	GRADUATE
NATURALISTIC SIG. OF F = .000	-0.61	-0.54	-0.20	0.36	1.13
ECOLOGISTIC SIG. OF F = .000	-0.35	-0.58	-0.21	0.24	1.38
HUMANISTIC SIG. OF F = .728	-0.27	-0.04	0.02	0.08	-0.01
MORALISTIC SIG. OF F = .000	-0.27	-0.49	-0.33	0.36	1.32
SCIENTISTIC SIG. OF F = .000	-0.21	-0.22	-0.19	0.17	0.83
UTILITARIAN SIG. OF F = .000	0.87	0.31	0.12	-0.29	-0.85
DOMINIONISTIC SIG. OF F = .019	0.20	0.14	0.11	-0.13	-0.45
NEGATIVISTIC SIG. OF F = .000	0.95	0.33	0.18	-0.38	-0.99
KNOWLEDGE SIG. OF F = .000	-5.10	-3.36	-1.27	2.36	7.73

FIGURE 14

EDUCATION GROUPS BY SELECTED KNOWLEDGE AND ATTITUDE SCALES



scores were highly significant, as persons with a graduate education had the highest naturalistic and next to lowest negativistic scores of any demographic group. In contrast, as the level of educational attainment decreased, the lower were the naturalistic and higher the negativistic scores. Additionally, the shift to a score above or below the general population mean on these two scales occurred at the less than college education level. In other words, not only did educational achievement have a direct impact on interest and affection for animals, but the experience of a college education appeared to represent a particularly critical event.

This pattern was similarily evident with respect to knowledge of animals. Knowledge scale differences were very significant with graduate education respondents scoring higher than any other demographic group in contrast to persons with less than an 11th grade education who had lower scores than all groups except non-whites. Moreover, the correlation was linear with the shift from a positive to negative score in relation to the overall population mean occurring at the high school to college education level.

In marked departure from these results, no significant differences were found on the humanistic scale. This finding strongly implied that increasing education largely effects interest, affection and knowledge of wildlife, but has minimal impact on emotional attachment to individual animals, particularly pets.

Substantial educational variations in concern for the ethical treatment of animals and the health and well-being of natural habitats were reflected in highly significant moralistic and ecologistic results. Ecologistic differences were especially large although, somewhat anomalously, respondents with a 9th - 11th grade education had lower ecologistic scores than those with an eighth grade or less education. Nevertheless, college educated respondents, particularly those with a graduate education, had the highest ecologistic scores of any demographic group. Moralistic differences, while significant, were less impressive with no educational group having outstanding scores with the exception of respondents with a graduate education, who were only exceeded by Pacific Coast residents and clerical workers in extent of moralistic concern for animals.

Significant differences also occurred on the utilitarian scale. In a manner similar to naturalistic, negativistic, and ecologistic results, utilitarian scale differences tended to be linear and among the largest encountered in the study. Deviations among respondents with a graduate versus less than eighth grade education were especially great, suggesting a profound divergence in willingness to exploit animals and natural habitats for the sake of human advantage and material gain.

This pattern was also reflected in concern for endangered species, as differences among education groups on a scale designed to measure protectionist sentiment were among the largest found.*

To recapitulate, educational variations were typically large and among the most significant of the study. They also tended to be linear, consistently increasing or decreasing across the various levels of educational attainment. Moreover, they often shifted in a positive or negative relation to the overall population mean at the transition point from a high school to a college education. Collectively, these results suggested the profound importance of education as a major factor determining basic affection, knowledge and concern for the well-being of animals and the natural environment. This pattern was further suggested by far greater participation rates among the more educated in most animal-related activities as indicated by Figure 15.

The importance of education as a determinant of attitudes and knowledge of animals was further corroborated by two additional findings. First, income group differences, while tending in the same direction, were rarely as impressive and, in fact, were non-significant on the moralistic, ecologistic and scientistic scales. The implication was that education results were not simply a function of differences in material affluence or available leisure time -- i.e., higher education appeared to have an important impact unrelated to the generally greater incomes of the more educated. Secondly, when college education respondents were distinguished according to their disciplinary concentration, very little difference was found in interest or concern for wildlife between those who majored in the physical science, social science or education fields. In other words, the experience of a college education, rather than these particular kinds of knowledge acquired in college, appeared to be the critical factor in influencing attitudes and knowledge of animals. On the other hand, physical science, social science and education majors had very different scores than liberal arts, business, law or medical students on the naturalistic, ecologistic, moralistic and negativistic scales (Table 43).

INCOME

Despite less impressive income than education results, income was still significantly related to interest, appreciation and knowledge of animals. This relationship, however, was not strong or consistent across all income groups and a number of important anomalies were present (Figure 16 and Table 44).

For example, naturalistic results, while significant, were not especially out-

*A more thorough description of the endangered species scale, and the relationship of demographic groups to this scale, can be found in another report.[8]

FIGURE 15

EDUCATION CHARACTERISTICS OF SELECTED ANIMAL ACTIVITY GROUPS

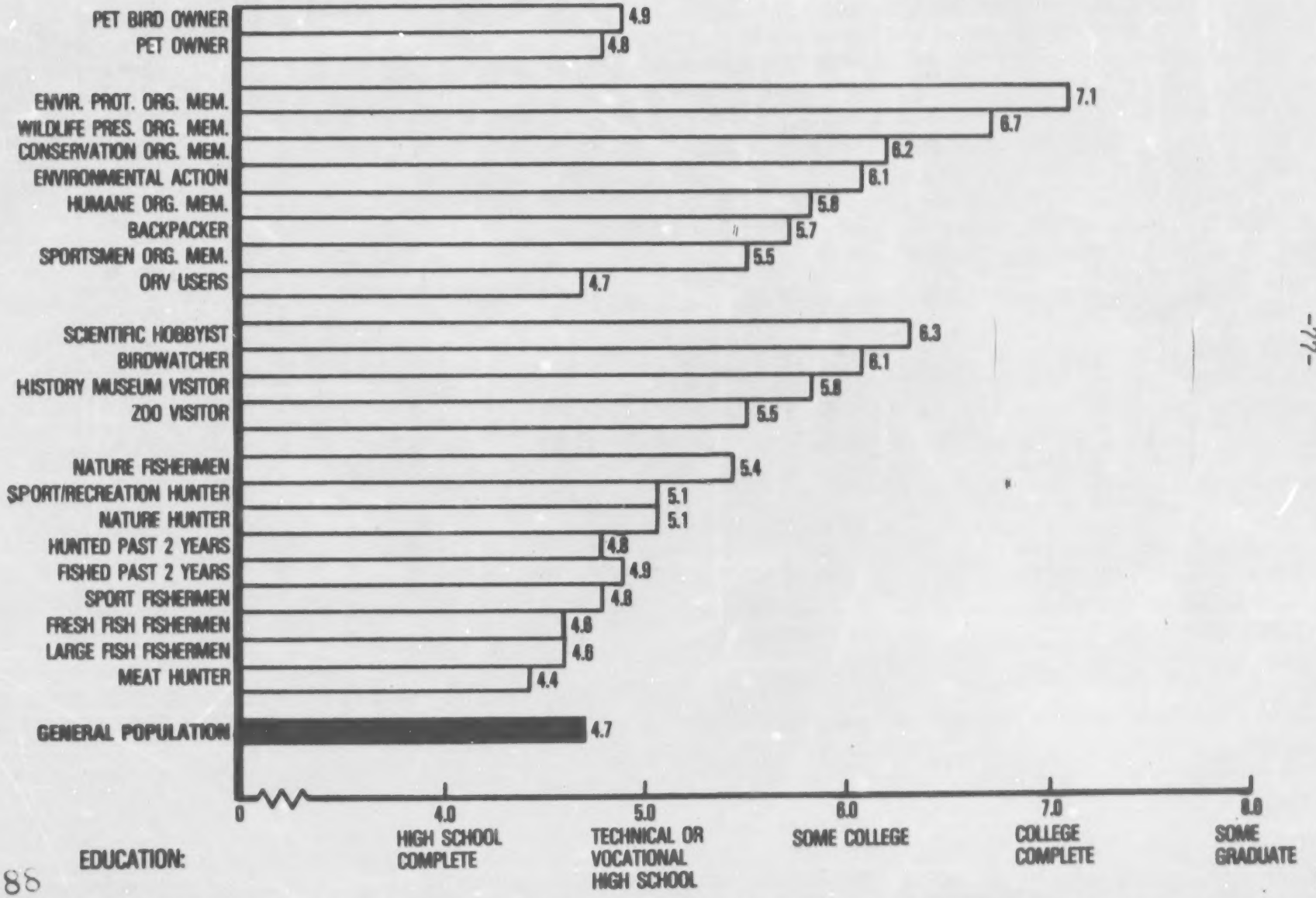


TABLE 43

COLLEGE DEGREE X SELECTED ATTITUDE SCALES

	SCIENCE	LIBERAL ARTS	BUSINESS	LAW/MEDICINE	SOCIAL SCIENCE/ EDUCATION
NATURALISTIC					
LOW	27.6 %	40.2	46.4	40.9	34.5
MEDIUM	25.1	25.1	28.3	34.5	27.6
HIGH	47.3	34.7	25.3	24.6	37.9
				$X^2 = 17.98$, P = .022	
ECOLOGISTIC					
LOW	32.4 %	38.4	40.1	60.0	36.5
MEDIUM	29.3	29.4	31.6	23.0	29.3
HIGH	38.3	32.2	28.3	17.0	34.1
				$X^2 = 17.72$, P = .023	
MORALISTIC					
LOW	48.0 %	37.1	35.3	36.9	28.7
MEDIUM	7.9	16.3	22.8	18.3	13.1
HIGH	44.1	46.5	41.9	44.8	58.1
				$X^2 = 22.45$, P = <.005	
UTILITARIAN					
LOW	44.4 %	48.9	37.6	42.0	53.9
MEDIUM	20.9	16.1	25.9	21.1	18.9
HIGH	34.5	35.0	36.5	36.9	27.1
				$X^2 = 12.95$, P = .13	
NEGATIVISTIC					
LOW	69.7 %	53.2	46.0	40.1	54.9
MEDIUM	20.9	29.3	29.8	42.8	26.0
HIGH	9.4	17.5	24.2	17.0	19.0
				$X^2 = 24.75$, P = <.005	

FIGURE 16

INCOME GROUPS BY SELECTED KNOWLEDGE AND ATTITUDE SCALES

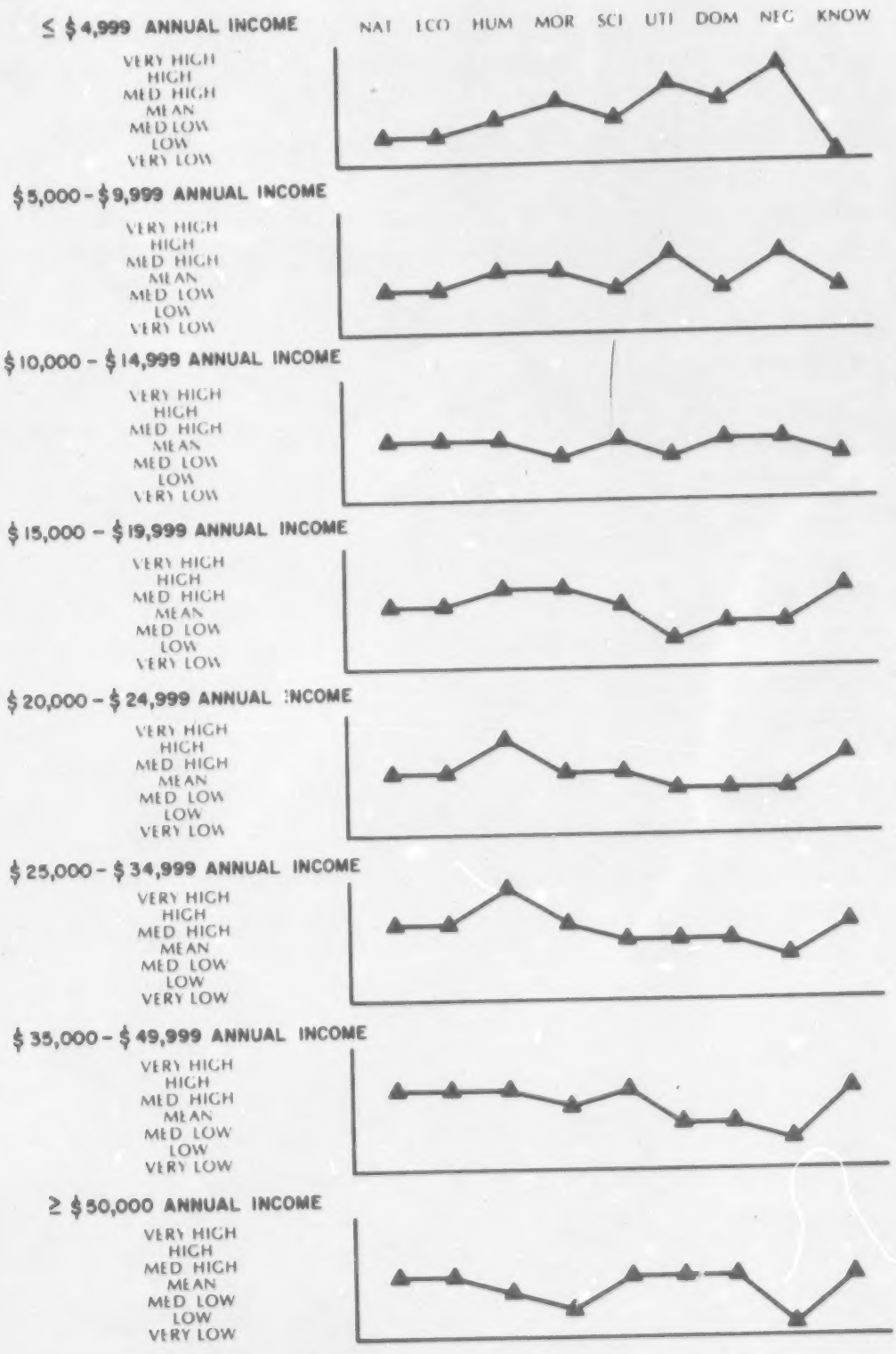


TABLE 44

ANALYSIS OF VARIANCE AND MULTIPLE CLASSIFICATION

ANALYSIS FOR INCOME X ATTITUDE AND KNOWLEDGE SCALES

	DEVIATION FROM GRAND MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES			
	$0-9,999	10,000-19,999	20,000-34,999	35,000+
NATURALISTIC SIG. OF F = .005	0.04	0.06	0.09	0.29
ECOLOGISTIC SIG. OF F = .257	0.01	0.01	0.05	0.20
HUMANISTIC SIG. OF F = .000	-0.02	-0.05	0.36	-0.03
MORALISTIC SIG. OF F = .175	0.15	-0.01	0.23	-0.34
SCIENTISTIC SIG. OF F = .853	-0.02	0.03	0.01	0.00
UTILITARIAN SIG. OF F = .004	0.19	-0.36	-0.08	0.25
DOMINIONISTIC SIG. OF F = .497	0.05	-0.07	-0.02	0.23
NEGATIVISTIC SIG. OF F = .000	0.24	-0.10	-0.21	-0.52
KNOWLEDGE SIG. OF F = .000	0.04	0.45	0.72	0.64

standing. In fact, after adjusting for other demographic factors, only respondents with incomes greater than $35,000 had scores appreciably higher than the general population. Additionally, although humanistic scale results were significant, only respondents earning between 20 and $35,000 had particularly high scores, while respondents with the highest and lowest incomes had nearly identical scores.

Income results on the knowledge, scientistic, ecologistic and moralistic scales were even less impressive. Knowledge differences were significant but not substantial with no income group ranking among the highest scoring demographic groups. Additionally, no significant differences were found on the scientistic scale. Finally, the most dramatic instance of less outstanding income than education results was the insignificance of income as a differentiator of ecologistic and moralistic attitudes toward animals. Income did not appear to exert an important influence on concern for problems of natural habitats or the ethical treatment and welfare of animals.

Utilitarian scale differences among income groups were significant. Paradoxically, however, respondents earning greater than $35,000 scored higher on the utilitarian scale than those earning less than $10,000 -- a very different pattern than that observed when comparing higher with lower education groups. Interestingly, the lowest utilitarian scores were obtained by those earning between ten and $15,000.

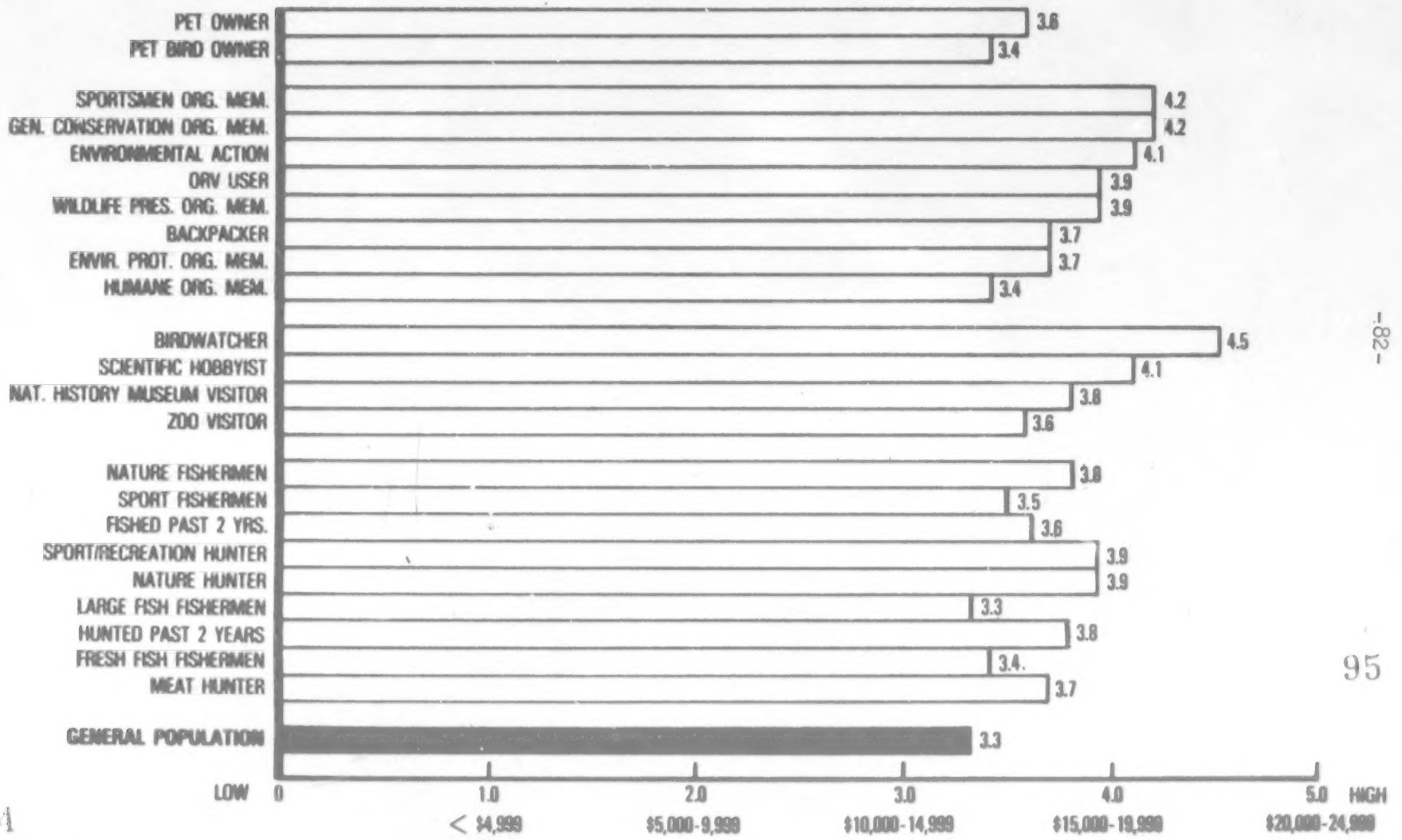
Thus, the overwhelming impression was that income had limited relevance as a predictor of protectionist concern or intellectual interest in animals. On the other hand, greater affection and involvement with animals, particularly wildlife, were observed among higher income respondents. Moreover, participation rates in most animal-related activities was significantly greater among higher than lower income groups (Figure 17). Socioeconomic status as measured by income and education was, therefore, an important determinant of interest and contact with animals. On the other hand, no consistent relationship was observed among these two demographic factors regarding concern for the welfare and rights of animals or for protecting the natural environment. Although higher education appeared to foster a heightened sense of ethical responsibility and concern for animals, no similar relationship was evident among those characterized by higher incomes.

POPULATION OF RESIDENCE

Differences in the attitudes and knowledge of urban versus rural respondents were assessed in three ways: differences distinguished by the population of the

FIGURE 17

INCOME CHARACTERISTICS OF SELECTED ANIMAL ACTIVITY GROUPS



towns where the respondents presently resided, where they were primarily raised, and the amount of acreage associated with their present place of residence. As these findings are somewhat redundant, major emphasis will be on the population of the respondents present residence (Figure 18 and Table 45).

No significant differences were found among varying population groups in affection for pets or wildlife as measured by the naturalistic and humanistic scales. The only outstanding urban/rural differences on these scales were the substantially lower humanistic and higher naturalistic scores of persons residing in highly rural areas of less than 500 population (property owners with more than 200 acres also had similar scores on these scales). Moreover, significantly higher naturalistic scores were characteristic of persons raised in small towns (although not open-country areas). Greater wildlife contact among rural residents was also reflected in higher participation rates in wildlife-related activities such as hunting, fishing, trapping and birdwatching as indicated by Figure 19.

Some significant differences occurred among rural versus urban residents in general interest and knowledge of animals. For example, persons residing in towns of less than 500 population had much lower negativistic scale scores. Additionally, rural respondents had significantly higher knowledge scores, in particular contrast to those from areas of more than one million population (who only scored higher than respondents under 25 and over 76, persons with less than an 11th grade education and blacks among all demographic groups). Moreover, all population groups with greater than 50,000 people had knowledge scores below the general population mean. Somewhat inconsistently, however, no significant knowledge differences were observed among population groups based on where respondents were raised (Table 46).

Some impressive and important urban/rural attitude distinctions occurred on the moralistic and utilitarian scales, suggesting fundamental differences in perception of land and wildlife use among these varying population groups. Moralistic differences were especially pronounced with residents of areas of less than 500 population having moralistic scores lower than any other demographic group. This lack of concern for animal rights and cruelty issues was also found among persons raised in sparsely populated areas and in large property owners (Table 47). In striking contrast, very high moralistic scores were characteristic of those residing in large cities of greater than one million population although, curiously, not among persons living in urban areas of any less population size. The greater ethical sensitivity of large city respondents was also reflected in far more opposition to hunting and predator control (Tables 48 - 49). Utilitarian scale results

FIGURE 18

POPULATION OF PRESENT RESIDENCE BY SELECTED KNOWLEDGE AND ATTITUDE SCALES

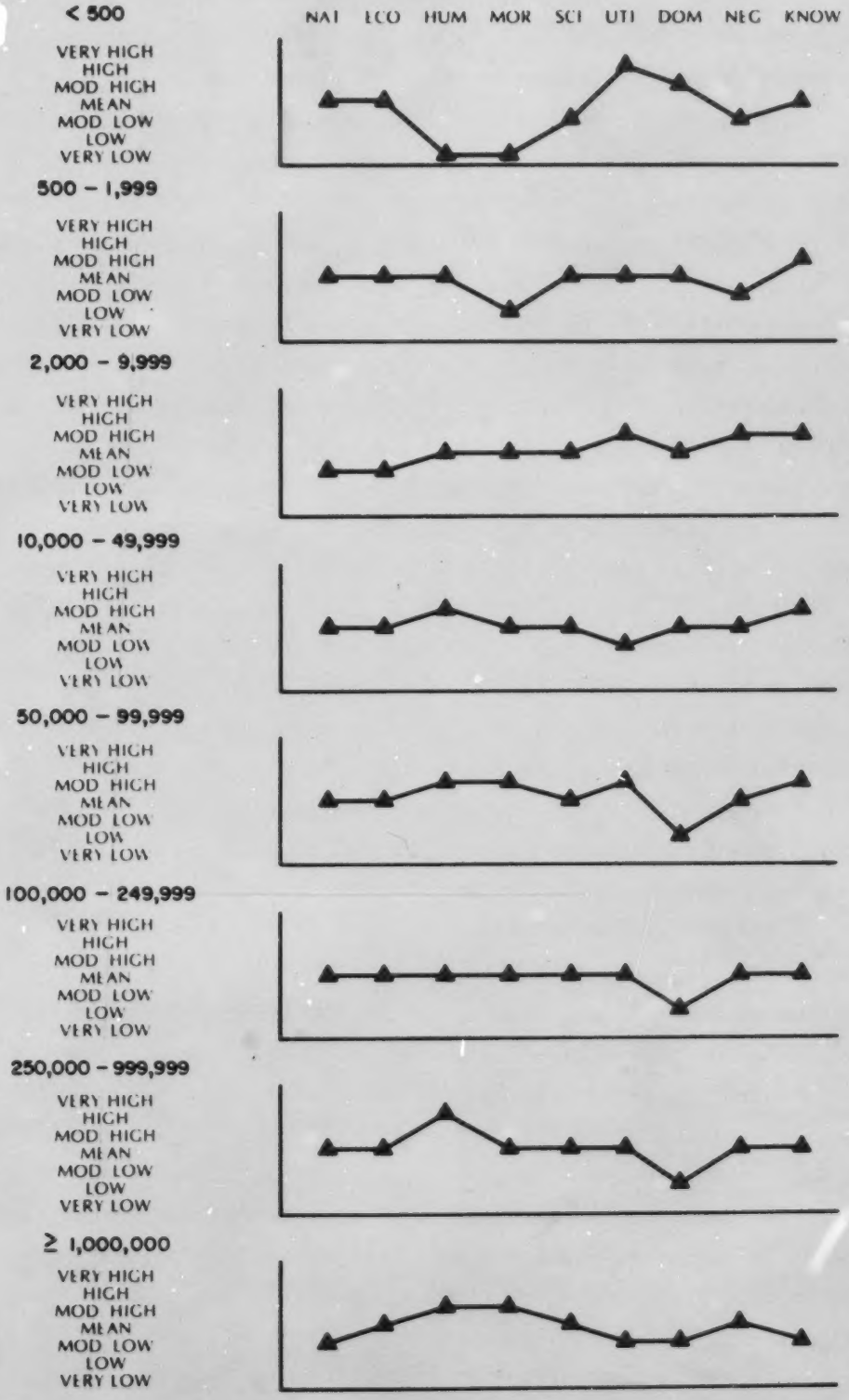


TABLE 45

ANALYSIS OF VARIANCE AND MULTIPLE CLASSIFICATION ANALYSIS FOR POPULATION PRESENT RESIDENCE X ATTITUDE AND KNOWLEDGE SCALES

	DEVIATION FROM GRAND MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES						
	≤500	500-1,999	2,000-9,999	10,000-49,999	50,000-249,999	250,000-999,999	1 MILLION+
NATURALISTIC SIG. OF F = .369	0.27	0.25	-0.11	0.11	0.02	-0.02	-0.27
ECOLOGISTIC SIG. OF F = .759	0.20	0.24	-0.09	-0.05	0.03	-0.10	0.02
HUMANISTIC SIG. OF F = .616	-0.42	-0.02	-0.05	0.03	0.01	0.20	-0.06
MORALISTIC SIG. OF F = .022	-1.50	-0.83	-0.05	0.02	0.18	-0.01	0.38
SCIENTISTIC SIG. OF F = .485	-0.11	0.10	0.04	0.07	-0.03	0.02	-0.11
UTILITARIAN SIG. OF F = .117	0.32	-0.09	0.44	-0.12	0.18	-0.05	-0.45
DOMINIONISTIC SIG. OF F = .122	0.12	-0.16	0.17	0.15	-0.16	-0.16	0.03
NEGATIVISTIC SIG. OF F = .025	-0.59	-0.49	0.29	-0.03	-0.01	0.19	0.04
KNOWLEDGE SIG. OF F = .005	0.65	1.40	1.53	0.55	-0.13	-0.74	-2.07

FIGURE 19

URBAN-RURAL CHARACTERISTICS OF SELECTED ANIMAL ACTIVITY GROUPS

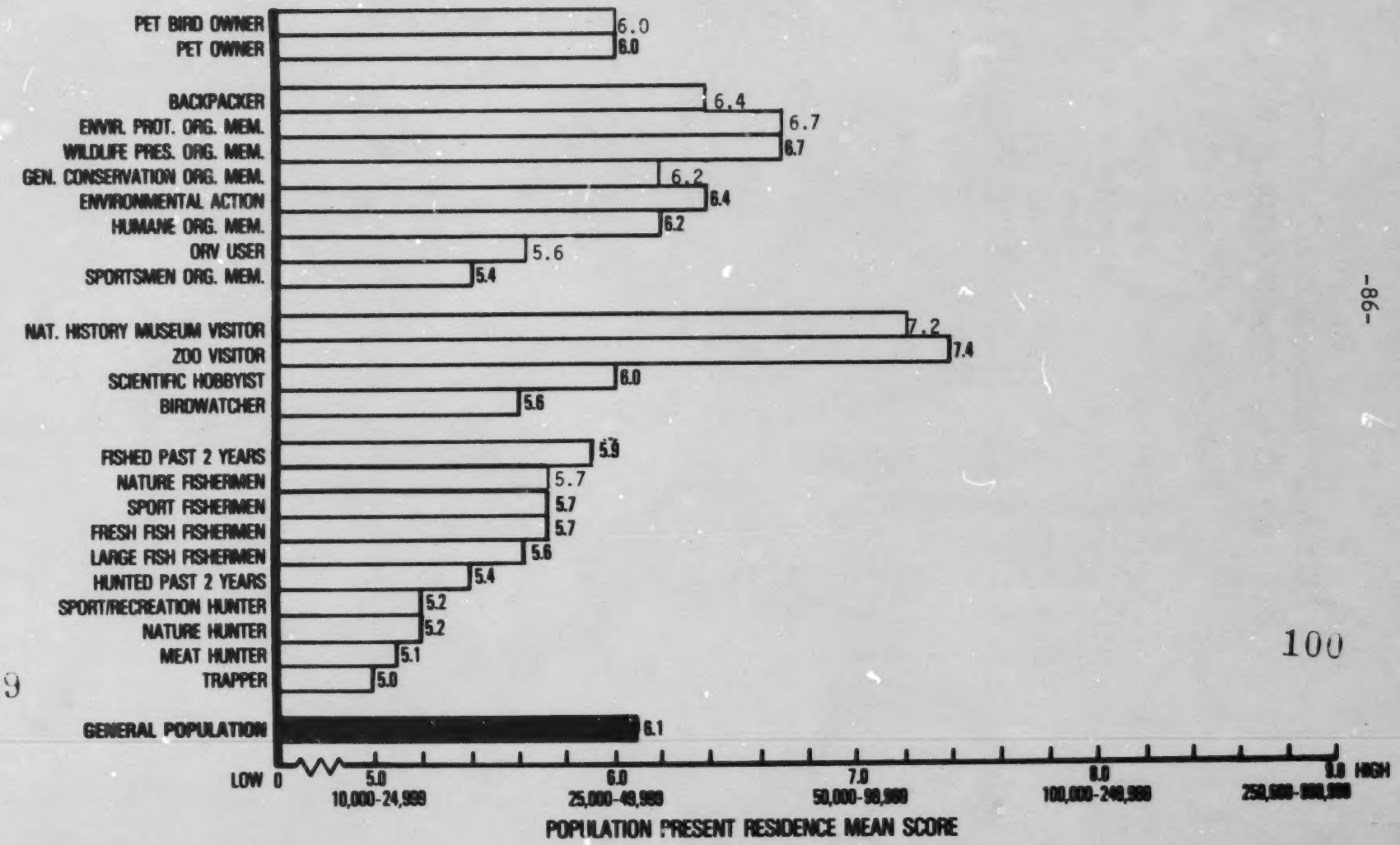


TABLE 46
RELATIONSHIP OF POPULATION OF CHILDHOOD RESIDENCE
TO KNOWLEDGE AND SELECTED ATTITUDE SCALES

	X^2	SIG. OF X^2
KNOWLEDGE SCALE	66.14	0.374
MORALISTIC SCALE	100.14	0.000
UTILITARIAN SCALE	109.06	0.000

TABLE 47
RELATIONSHIP OF PROPERTY OWNERSHIP
TO KNOWLEDGE AND SELECTED ATTITUDE SCALES*

	F	SIG. OF F
KNOWLEDGE SCALE	6.03	0.0001
**MORALISTIC SCALE	1.549	0.1855
UTILITARIAN SCALE	7.218	0.0000

*PROPERTY OWNERSHIP CATEGORIES ARE: (1) DON'T KNOW, (2) <1/4 ACRE, (3) 1/3 - 1 ACRE, (4) 2 - 50 ACRES, (5) 51 - 200 ACRES, (6) 201 +

**WHEN ONLY PROPERTY OWNERSHIP GROUPS OF LESS THAN 1/4 AND MORE THAN 200 ACRES WERE COMPARED ON THE MORALISTIC SCALE, THE DIFFERENCE WAS SIGNIFICANT ($T = 2.014$, $P = .05$).

TABLE 48

POPULATION PRESENT RESIDENCE X HUNTING AND PREDATOR CONTROL ISSUES

DO YOU APPROVE OF HUNTING FOR RECREATION AND MEAT?

	STRONGLY APPROVE	APPROVE	SLIGHTLY APPROVE	SLIGHTLY DISAPPROVE	DISAPPROVE	STRONGLY DISAPPROVE
UNDER 500 POPULATION	(11) 13.7	(45) 54.7	(14) 16.9	(4) 5.2	(7) 8.2	(1) 1.1
		85		15		
25,000-49,999	(27) 8.9	(87) 28.6	(86) 28.0	(39) 12.7	(34) 11.0	(29) 9.6
		66		33		
1 MILLION +	(30) 9.2	(62) 18.9	(58) 17.7	(61) 18.7	(69) 21.2	(40) 12.4
		46		52		

$X^2 = 73.24$, $P = \leq .0001$

TABLE 49

SOME RANCHERS CLAIM SUBSTANTIAL ECONOMIC LOSS BECAUSE COYOTES KILL THEIR SHEEP. WOULD YOU APPROVE OF SHOOTING OR TRAPPING AS MANY COYOTES AS POSSIBLE?

	STRONGLY APPROVE	APPROVE	SLIGHTLY APPROVE	SLIGHTLY DISAPPROVE	DISAPPROVE	STRONGLY DISAPPROVE
UNDER 500 POPULATION	(10) 12.2	(25) 29.7	(11) 13.9	(9) 10.6	(21) 25.7	(5) 6.5
		56		43		
1 MILLION +	(17) 5.3	(43) 13.0	(45) 13.9	(47) 14.4	(103) 31.7	(59) 18.0
		32		64		

$X^2 = 22.46$, $P = \leq .0004$

were also substantial, especially when comparing the largest and smallest population groups. Respondents residing in cities of more than one million population, in addition to high moralistic scores, had the sixth lowest utilitarian scores of all demographic groups.

Somewhat unexpectedly, rural residents, despite limited moralistic and pronounced utilitarian sentiments,had relatively high scores on the ecologistic scale. Apparently, residents of sparsely populated areas, notwithstanding support for most practical uses of animals, were still concerned about maintaining and protecting wildlife populations and natural habitats.

Large moralistic and utilitarian differences in rural versus urban attitudes reflect fundamental distinctions in outlook regarding the appropriate human use and treatment of animals. As a consequence, wildlife managers will need to be especially appreciative and understanding of these varying perceptions if credibility is to be maintained with persons of all population groups. Indeed, the urban/rural challenge may represent one of the most difficult and important problems confronting the wildlife management field in the 1980's.

REGION

Region emerged as an extremely sensitive differentiator of public perceptions and understanding of animals. Significant differences were detected on nearly every attitude scale, and quite often particular regions were among the highest and lowest scoring demographic groups (Figure 20 and Table 50). The distinctiveness of these results strongly suggested the value of designing management programs in ways consistent with the particular views and needs of diverse sections of the country, especially Alaska, the Rocky Mountain, Pacific Coast and Southern regions.

Considerable interest in wildlife, the out-of-doors and animals in general were evident among respondents from Alaska, the Pacific Coast and Rocky Mountain states. Alaska, in particular, had the second highest naturalistic and lowest negativistic scores of all demographic groups in the study. Additionally, as Figures 21 and 22 reflect, Alaskans participated more often in almost all consumptive and non-consumptive wildlife-related activities. The naturalistic scores of Pacific Coast and Rocky Mountain residents were less pronounced, but still considerably higher than in other regions, except the Northcentral states. In contrast, the lowest naturalistic and highest negativistic scores occurred in the South, although neither score was particularly outstanding when compared to other demographic groups.

FIGURE 20

REGIONS BY SELECTED KNOWLEDGE AND ATTITUDE SCALES

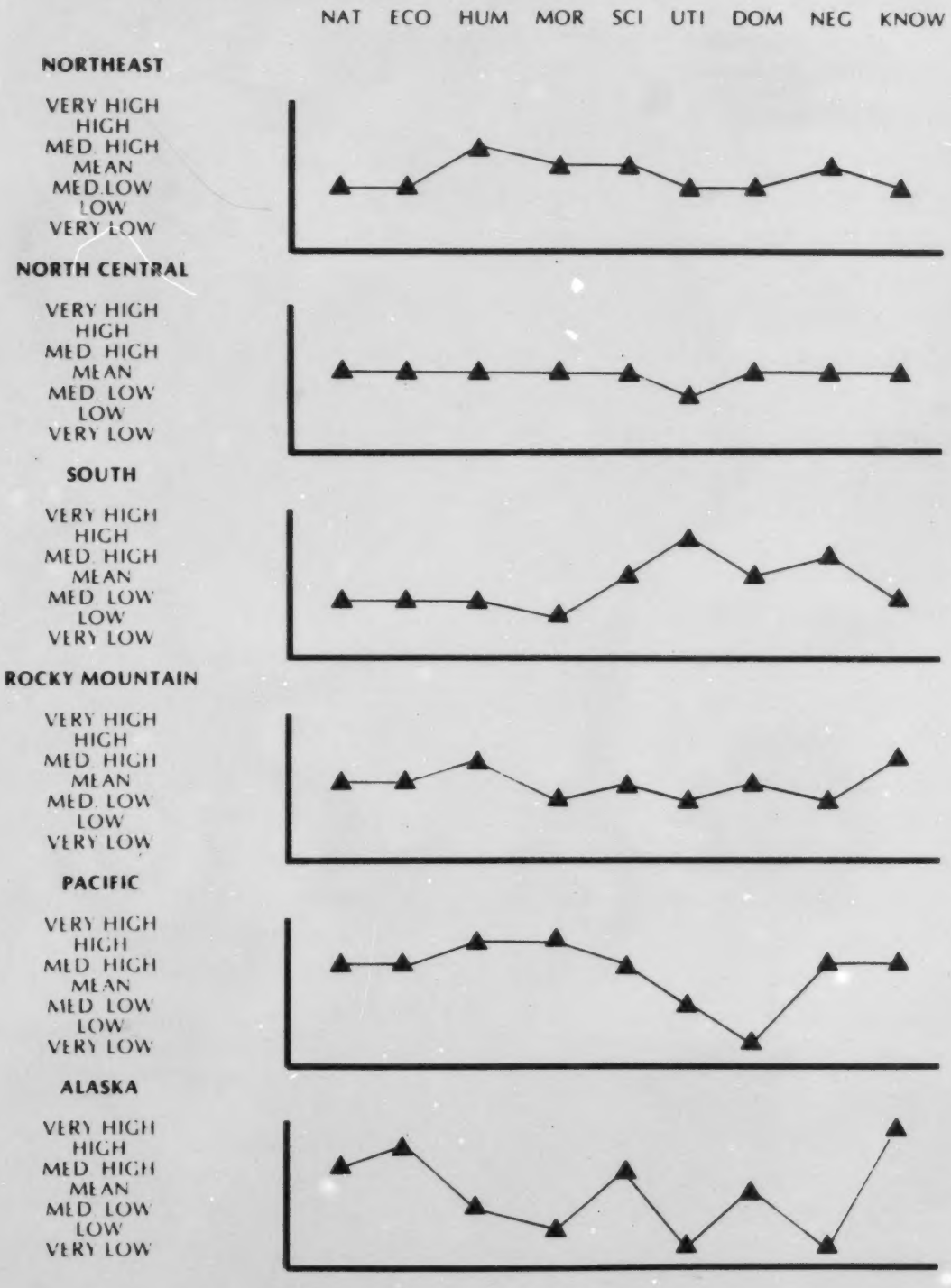


TABLE 50

ANALYSIS OF VARIANCE AND MULTIPLE CLASSIFICATION ANALYSIS RESULTS FOR KNOWLEDGE AND ATTITUDE SCALES X REGION

	F	SIG OF F	DEVIATION FROM GRAND MEAN ADJUSTED FOR INDEPENDENTS AND COVARIATES
KNOWLEDGE	4.45	0.000	
NORTHEAST			-1.24
NORTH CENTRAL			-0.33
SOUTH			-0.24
ROCKY MOUNTAINS			2.30
PACIFIC			0.88
ALASKA			4.55
NATURALISTIC	4.58	0.000	
NORTHEAST			-0.21
NORTH CENTRAL			0.15
SOUTH			-0.23
ROCKY MOUNTAINS			0.20
PACIFIC			0.30
ALASKA			1.00
ECOLOGISTIC	4.91	0.000	
NORTHEAST			-0.17
NORTH CENTRAL			0.03
SOUTH			-0.09
ROCKY MOUNTAINS			0.00
PACIFIC			0.29
ALASKA			1.03
NEGATIVISTIC	5.98	0.000	
NORTHEAST			-0.19
NORTH CENTRAL			0.23
SOUTH			0.30
ROCKY MOUNTAINS			-0.22
PACIFIC			-0.22
ALASKA			-1.21
UTILITARIAN	8.94	0.000	
NORTHEAST			-0.35
NORTH CENTRAL			-0.45
SOUTH			0.88
ROCKY MOUNTAINS			-0.22
PACIFIC			-0.09
ALASKA			-0.70
MORALISTIC	13.88	0.000	
NORTHEAST			0.15
NORTH CENTRAL			-0.06
SOUTH			-0.82
ROCKY MOUNTAINS			-0.37
PACIFIC			1.65
ALASKA			-1.17
DOMINIONISTIC	7.18	0.000	
NORTHEAST			-0.12
NORTH CENTRAL			0.17
SOUTH			0.20
ROCKY MOUNTAINS			0.30
PACIFIC			-0.56
ALASKA			0.32
HUMANISTIC	3.05	0.010	
NORTHEAST			0.00
NORTH CENTRAL			0.06
SOUTH			-0.24
ROCKY MOUNTAINS			0.18
PACIFIC			0.31
ALASKA			-0.37

FIGURE 21

HUNTING, ANTI-HUNTING, FISHING AND TRAPPING X REGION

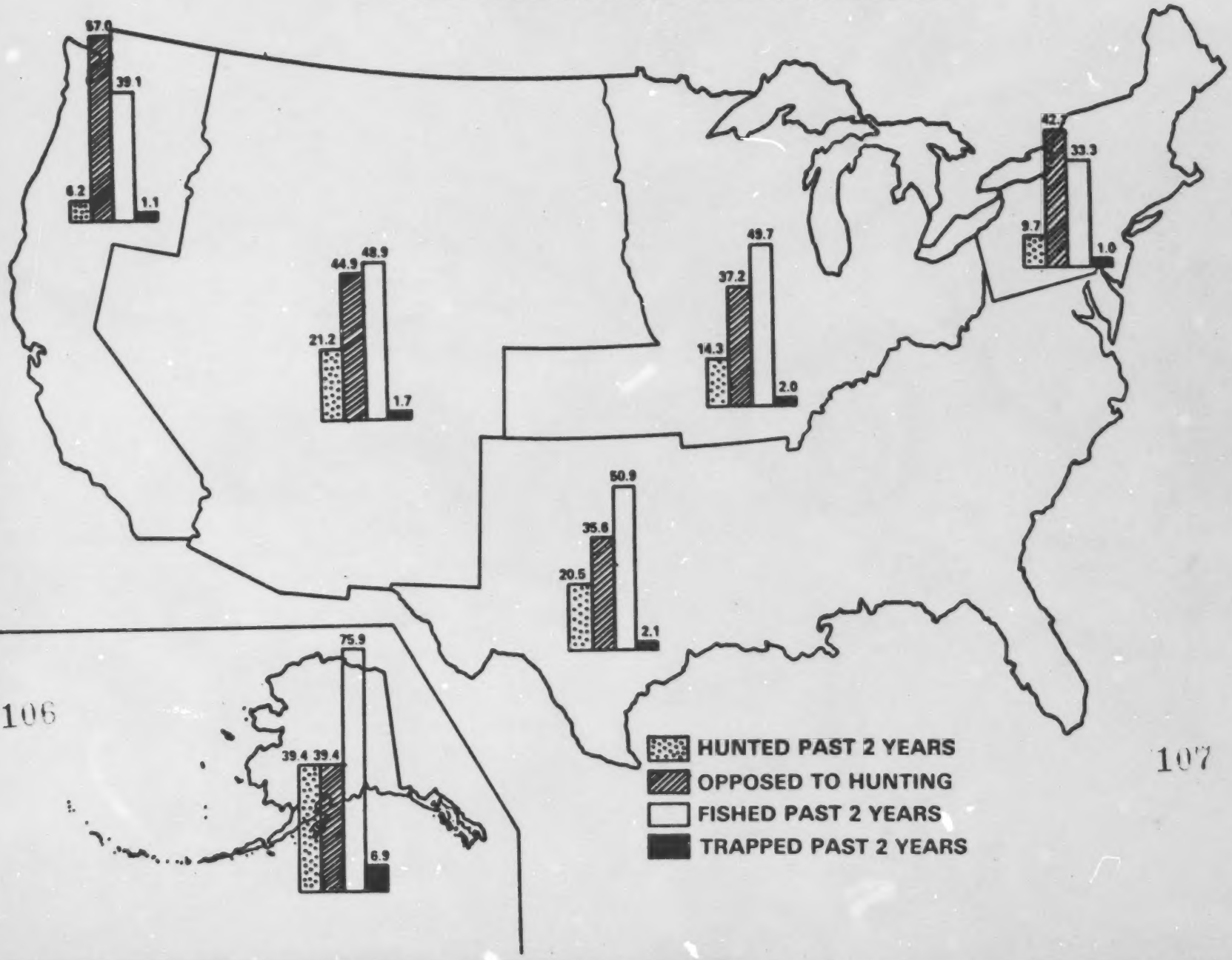


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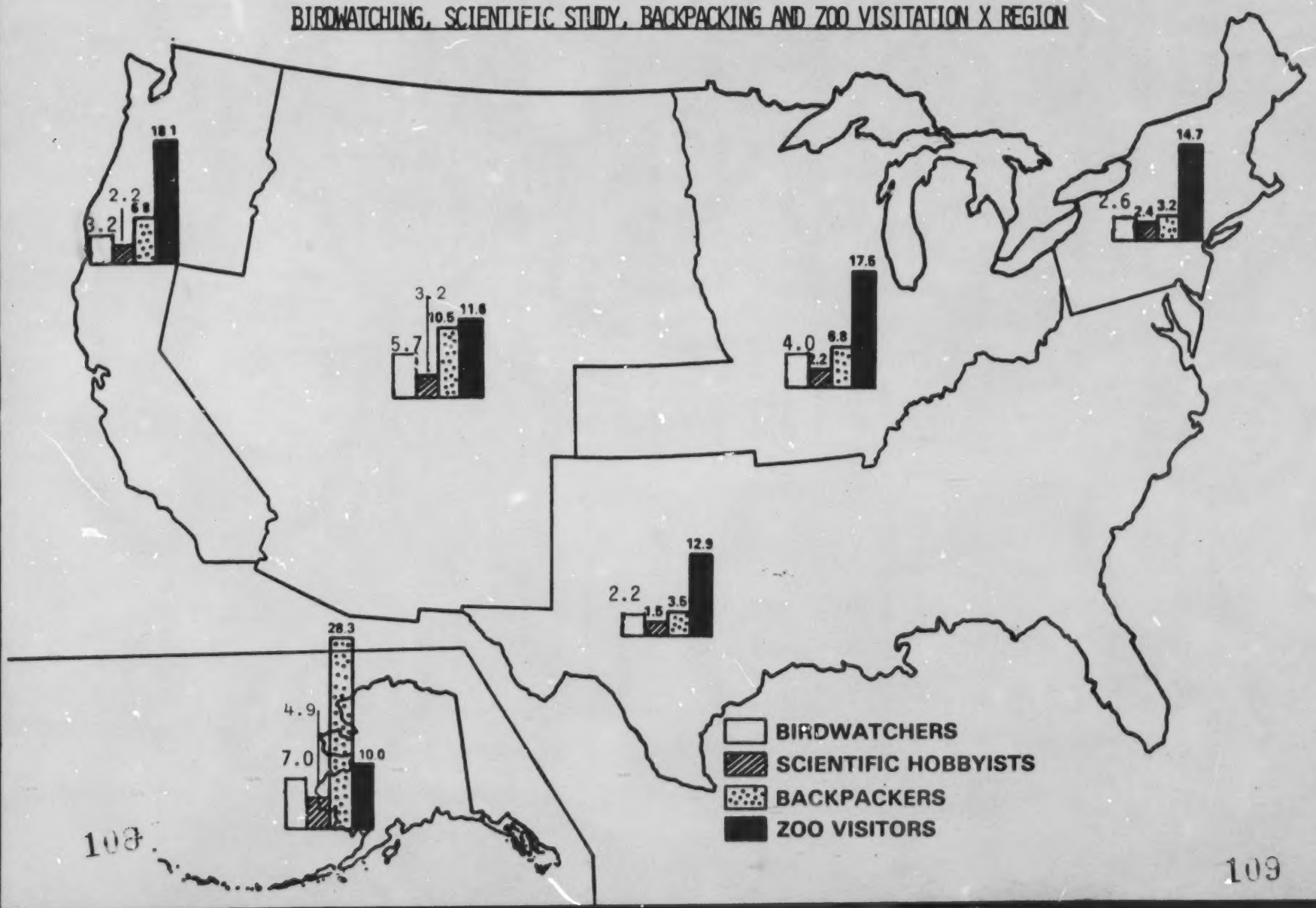
FIGURE 22

BIRDWATCHING, SCIENTIFIC STUDY, BACKPACKING AND ZOO VISITATION X REGION



Very significant regional differences were also found on the knowledge of animals scale. Alaskans had, by far, the highest scores, ranking only behind respondents with a graduate education among all demographic groups. Residents of the Rocky Mountain states also had high knowledge scores, above those of any other region of the country and even the college educated as a group. Interestingly, the Western states, as a whole, had knowledge scores substantially above those of any Eastern region. The Northeastern states had the lowest knowledge scores.

Despite a similar pattern of interest and knowledge of wildlife among Alaska and the Pacific Coast, they differed considerably in their degree of emotional attachment to animals, particularly pets. Whereas Alaskans had among the lowest humanistic scores of any group (lower scores occurring only among those over 75 years old and farmers), Pacific Coast residents, in contrast, had among the highest on this scale. On the other hand, the South, despite many differences from Alaska, was similarly characterized by low scores on this scale. Indeed, the Southern states, in comparison to other regions, appeared to be typified by a relatively unsentimental and detached attitude toward animals.

Major and important regional differences were also found in concern for the protection of wildlife and natural habitats. The views of Alaskans were, again, the most outstanding and atypical. In general, residents from this state expressed a far greater willingness than any other region to forsake a variety of human benefits in order to protect wildlife and natural ecosystems -- a tendency reflected in both exceptionally low utilitarian and extremely high ecologistic scores (indeed, the most outstanding scores of any demographic group on these scales). This protectionist sentiment was also reflected on a number of specific habitat preservation questions, as illustrated by Table 51 and Figures 23 - 25 concerning wetlands, forestry, park and wilderness natural resource development.

The protectionist concern of Alaskans, however, was primarily restricted to wildlife and natural habitat issues, and largely unrelated to animal cruelty and rights considerations or opposition to the consumptive use of animals. This was clearly reflected in very low moralistic and high dominionistic scores (on the moralistic scale, lower scores than any demographic group except those residing in areas of less than 500 population). Relatedly, Alaskans hunted, trapped and supported these activities to a far greater extent than found in any other area of the country.

The pattern of very low utilitarian, moralistic and quite high ecologistic

TABLE 51

BUILD PLANT ON MARSH X REGION

A LARGE COASTAL CITY HAS AN UNEMPLOYMENT PROBLEM. A MAJOR MANUFACTURER WANTS TO BUILD A NEW PLANT ON A MARSH IT OWNS WHICH COULD EMPLOY 1,000 PEOPLE, BUT CONSERVATIONISTS CLAIM THIS WILL DESTROY LAND NEEDED BY A RARE BIRD. DO YOU AGREE THAT THIS PLANT SHOULD BE BUILT EVEN IF IT ENDANGERS THE BIRD SPECIES?

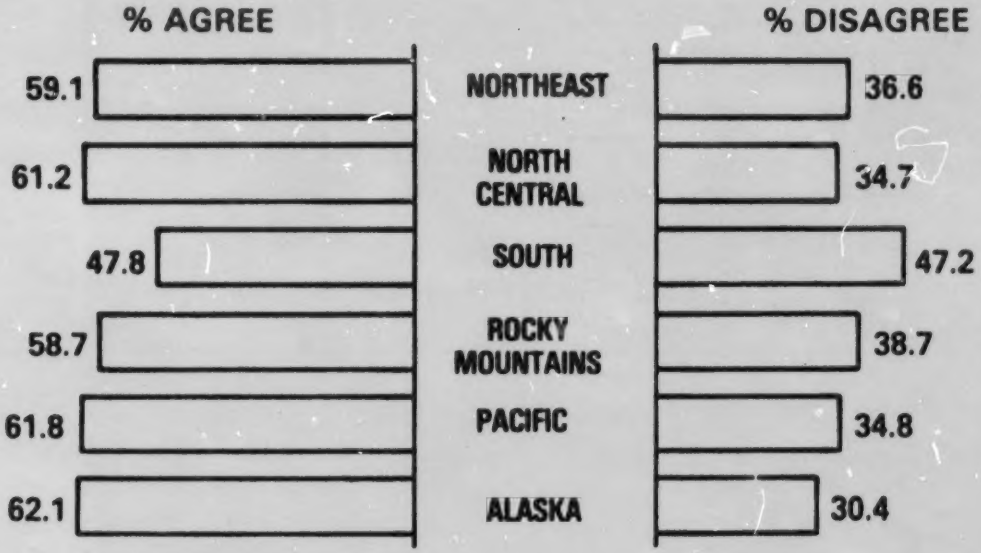
	AGREE	DISAGREE
NORTHEAST	(260) 39.5	(360) 54.5
NORTH CENTRAL	(176) 34.8	(308) 60.9
SOUTH	(280) 42.2	(338) 51.0
ROCKY MOUNTAINS	(198) 37.9	(306) 58.6
PACIFIC	(138) 37.7	(207) 56.4
ALASKA	(115) 33.0	(202) 58.0

$X^2 = 100.22$, $P = \leq .0001$

FIGURE 23

SET ASIDE FOREST LAND TO PROTECT GRIZZLY BEAR X REGION

It has been suggested that 5 million acres of national forest land be set aside so that the endangered grizzly bear remain undisturbed. The timber industry objects, saying that jobs and needed lumber will be lost. Would you agree to protect the endangered grizzly bear even if it resulted in the loss of some jobs and building material?

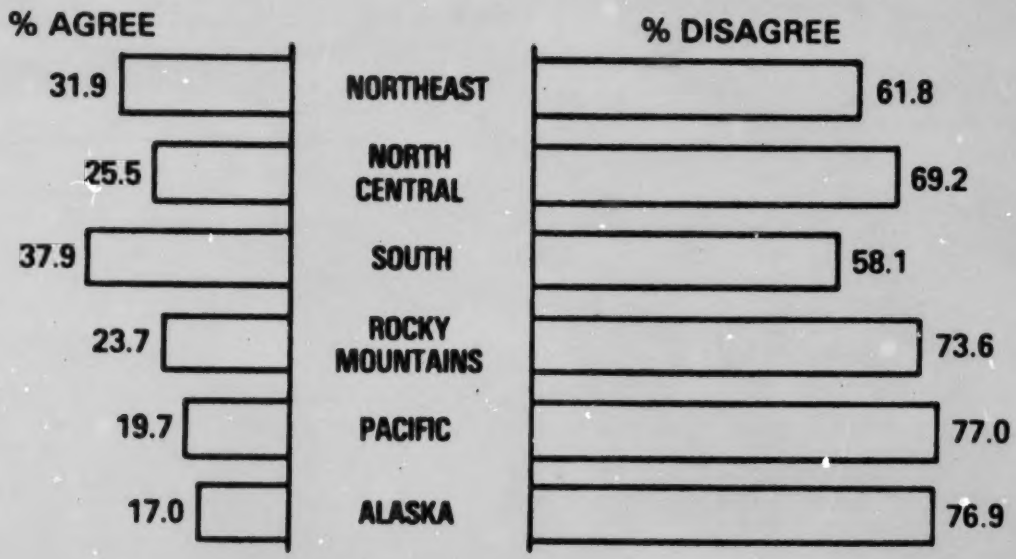


$X^2 = 125.26$, $P = \leq .0001$

FIGURE 24

DEVELOP PARK OIL BY REGION

If oil were discovered in Yellowstone Park it would have to be developed even if it meant harm to the park's wildlife.

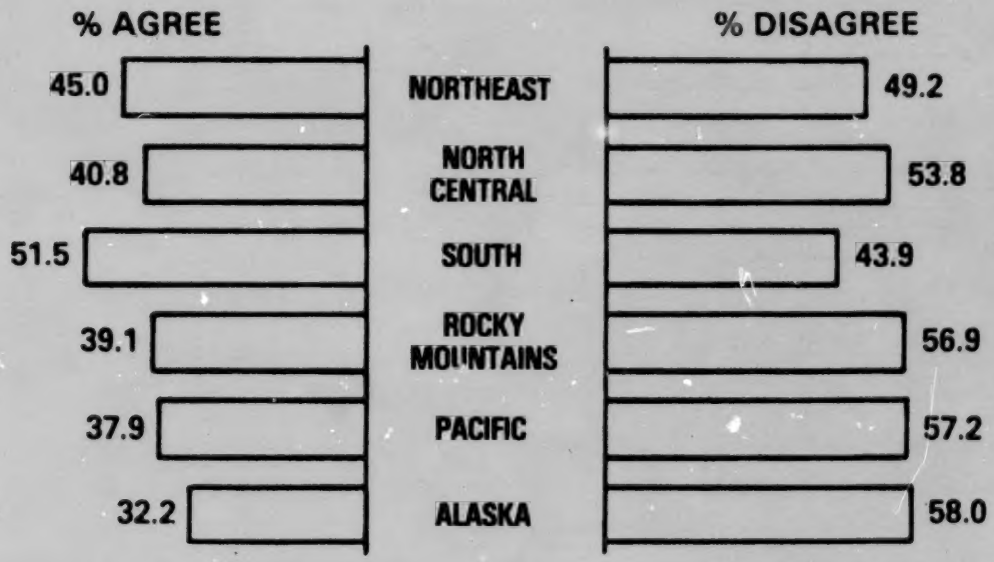


$X^2 = 150.34$, $P = \leq .0001$

FIGURE 25

NATURAL RESOURCE DEVELOPMENT X REGION

Natural resources must be developed even if the loss of wilderness results in much smaller wildlife populations.



$X^2 = 109.72$, $P = \leq .0001$

and dominionistic scores was unusual and only partially duplicated by two other groups in the study -- National Trappers Association members and, to a lesser extent, residents of the Rocky Mountain states. These three groups appeared to possess the unusual capability of seperating a strong appreciation and protectionist concern for wildlife and natural habitats from worries about animal cruelty and the right of humans to exert dominance and mastery over the natural environment.

The Pacific Coast states, more typically, manifested low scores on the utilitarian scale along with very high moralistic and ecologistic scores. The Pacific region, in fact, had moralistic scores higher than any demographic group and were the only region with a majority opposed to hunting. The South contrasted most of all, being characterized by very low moralistic, ecologistic, in addition to quite high utilitarian scores (higher on this latter scale than all demographic groups except farmers, respondents over 56 years of age and nonwhites).

The Rocky Mountain region tended to somewhat parallel the pattern found among Alaskans but at a less pronounced level. This was reflected by low moralistic, utilitarian, as well as high naturalistic, knowledge and dominionistic scores. Unlike Alaska, however, the ecologistic scores of the Rocky Mountain states were not especially high.

In addition to analysis of variance and multiple classification analysis tests, three-way cross tabulations also assessed the possible confounding relationship of other demographic variables, particularly urban/rural, age and educational factors. These various analyses largely corroborated the importance of region as an extremely sensitive differentiator of knowledge and attitudes toward animals. For example, tables 52 through 53 reveal highly significant differences among regions on the knowledge and utilitarian scales after controlling for rural versus urban residence. Thus, despite the strongly utilitarian attitude of rural respondents, striking regional differences remained among persons residing in sparsely populated areas. Additionally, highly significant regional differences occurred on the naturalistic and utilitarian scales when only comparing 18-35 year old respondents (Table 54). In other words, although younger persons expressed strong naturalistic and limited utilitarian attitudes, large regional differences still remained among persons in this age bracket on these scales.

The only demographic variable substantially affecting the relationship of region and the scales was education, and this to a limited degree. Specifically, insignificant regional differences occurred among sixth to eighth grade respon-

TABLE 52

% REGION X KNOWLEDGE OF ANIMALS X
50,000-250,000 POPULATION OF PRESENT RESIDENCE*

	LOW KNOWLEDGE	MODERATE KNOWLEDGE	HIGH KNOWLEDGE	
NORTHEAST	38.4 %	31.6	30.0	
NORTHCENTRAL	25.2	40.4	34.5	
SOUTH	25.4	37.1	37.6	
ROCKY MOUNTAINS	19.1	20.0	60.9	
PACIFIC	26.0	31.7	42.3	
ALASKA	13.7	28.0	58.3	

$X^2 = 78.52$, $P = \leq .0001$

*NUMBER OF RESPONDENTS PRESENT RESIDENCE 50,000-250,000 IN 3107 SAMPLE = 767

TABLE 53

% REGION X UTILITARIAN SCALE X 2,000-5,000 POPULATION OF PRESENT RESIDENCE*

	LOW UTILITARIAN 1	2	3	4	HIGH UTILITARIAN 5
NORTHEAST	25.0 %	20.8	19.4	13.9	20.8
NORTHCENTRAL	16.1	17.9	14.3	30.4	21.4
SOUTH	10.1	12.7	17.7	26.6	32.9
ROCKY MOUNTAINS	15.0	15.0	32.5	25.0	12.5
PACIFIC	4.8	19.0	14.3	33.3	28.6
ALASKA	36.4	25.5	10.9	14.5	12.7

$X^2 = 42.10$, $P = .0027$

*NUMBER OF RESPONDENTS PRESENT RESIDENCE 2,000-5,000 IN 3107 SAMPLE = 323

TABLE 54A

% REGION X NATURALISTIC SCALE X 18-35 YEARS OLD*

	LOW NATURALISTIC 1	2	3	4	HIGH NATURALISTIC 5
NORTHEAST	33.3 %	16.3	23.0	15.9	11.5
NORTHCENTRAL	21.9	11.8	29.4	16.0	20.9
SOUTH	31.6	16.6	24.7	16.2	10.9
ROCKY MOUNTAINS	20.7	14.8	29.1	18.1	17.3
PACIFIC	14.0	12.1	29.9	18.5	25.5
ALASKA	12.6	7.4	32.6	21.1	26.3

X^2 =78.23, P = $\leq$ .0001

*NUMBER OF 18-35 YEAR OLD RESPONDENTS IN 3107 SAMPLE = 1288

TABLE 54B

% REGION X UTILITARIAN SCALE X 18-35 YEARS OLD*

	LOW UTILITARIAN 1	2	3	4	HIGH UTILITARIAN 5
NORTHEAST	25.2 %	21.1	19.6	19.3	14.8
NORTHCENTRAL	28.3	29.9	19.3	18.7	3.7
SOUTH	17.0	21.5	21.1	23.9	16.6
ROCKY MOUNTAINS	22.4	30.0	20.7	16.5	10.5
PACIFIC	32.5	28.7	16.6	17.8	4.5
ALASKA	35.8	28.9	14.7	13.2	7.4

X^2 = 66.79, P = $\leq$ .0001

*NUMBER OF 18-35 YEAR OLD RESPONDENTS IN 3107 SAMPLE = 1288

dents on the knowledge of animals scale (Table 55). Thus, poorly educated persons throughout the country were characterized by a similar lack of animal knowledge. On the other hand, regional differences among the college educated were highly significant on all scales (as illustrated by the knowledge and naturalistic results of Table 56).

Three-way cross tabulational, analysis of variance and multiple classification results, therefore, strongly supported the importance of region as a determinant of basic attitudes and knowledge of animals. The broad management implication of these findings was that wildlife policies and practices should be developed in ways that sensitively address the specialized interests and perspectives of diverse regions of the country.

RELIGIOUS PARTICIPATION

One of the more interesting demographic results was the importance of participation in formal religious activities as a differentiator of basic attitudes and knowledge of animals. This demographic dimension was significantly related to nearly every scale, with differences tending to consistently increase or decrease across the varying levels of religious participation (Figure 26 and Table 57). These results suggested this aspect of American life has a substantive and possibly profound impact on sympathy, concern and affection for animals and the natural world. Unfortunately,the historical tendency has been to ignore the potential importance of the religious factor, and this may have resulted in the formulation of programs insufficiently cognizant of the latent support or antagonism of groups possessing strong religious views.

Major differences among religious participation groups in knowledge, interest and affection for animals were indicated by significant naturalistic, humanistic, negativistic and knowledge scale results. For example, respondents who rarely or never attended religious services had among the highest knowledge scores of any demographic group, in contrast to those who participated once a week or more who had very low knowledge scores.

Large and significant differences also occurred on the naturalistic and humanistic scales with respondents who rarely or never attended religious services being among the highest scoring demographic groups on these dimensions. Apparently, basic differences in affection and affinity for wildlife, the outdoors and pets distinguished the varying religious participation groups. Respondents minimally involved in religious activities were characterized by considerably great-

TABLE 55

% REGION X KNOWLEDGE OF ANIMALS X 6-8 GRADE EDUCATION*

	LOW KNOWLEDGE	MODERATE KNOWLEDGE	HIGH KNOWLEDGE	
NORTHEAST	48.9 %	30.2	21.0	
NORTHCENTRAL	40.5	33.3	26.2	
SOUTH	54.5	33.0	12.5	
ROCKY MOUNTAINS	31.2	40.6	28.2	
PACIFIC	60.1	26.6	13.4	
ALASKA	25.0	37.5	37.5	

$X^2 = 38.82$, $P = .3017$

*NUMBER OF 6-8 GRADE RESPONDENTS IN 3107 SAMPLE = 228

TABLE 56A

% REGION X KNOWLEDGE OF ANIMALS X COLLEGE EDUCATION*

	LOW KNOWLEDGE	MODERATE KNOWLEDGE	HIGH KNOWLEDGE	
NORTHEAST	29.4 %	30.4	40.2	
NORTHCENTRAL	15.6	36.9	47.5	
SOUTH	24.0	33.0	43.0	
ROCKY MOUNTAINS	19.2	25.1	55.7	
PACIFIC	22.0	35.5	42.5	
ALASKA	8.2	20.6	71.2	

$X^2 = 70.48$, $P = .0004$

*NUMBER OF COLLEGE EDUCATED RESPONDENTS IN 3107 SAMPLE = 944

TABLE 56B

% REGION X NATURALISTIC SCALE X COLLEGE EDUCATION*

	LOW NATURALISTIC 1	2	3	4	HIGH NATURALISTIC 5
NORTHEAST	34.5 %	20.6	23.7	11.3	9.8
NORTHCENTRAL	19.7	9.8	30.3	18.0	22.1
SOUTH	27.8	16.5	25.3	17.7	12.7
ROCKY MTS	25.1	15.3	24.0	18.0	17.5
PACIFIC	19.1	17.7	25.5	16.3	21.3
ALASKA	11.0	6.2	32.2	21.9	28.8

$X^2 = 68.68$, $P = \leq .0001$

*NUMBER OF COLLEGE EDUCATED RESPONDENTS IN 3107 SAMPLE = 944

FIGURE 26

ATTENDANCE AT RELIGIOUS SERVICES BY SELECTED KNOWLEDGE AND ATTITUDE SCALES

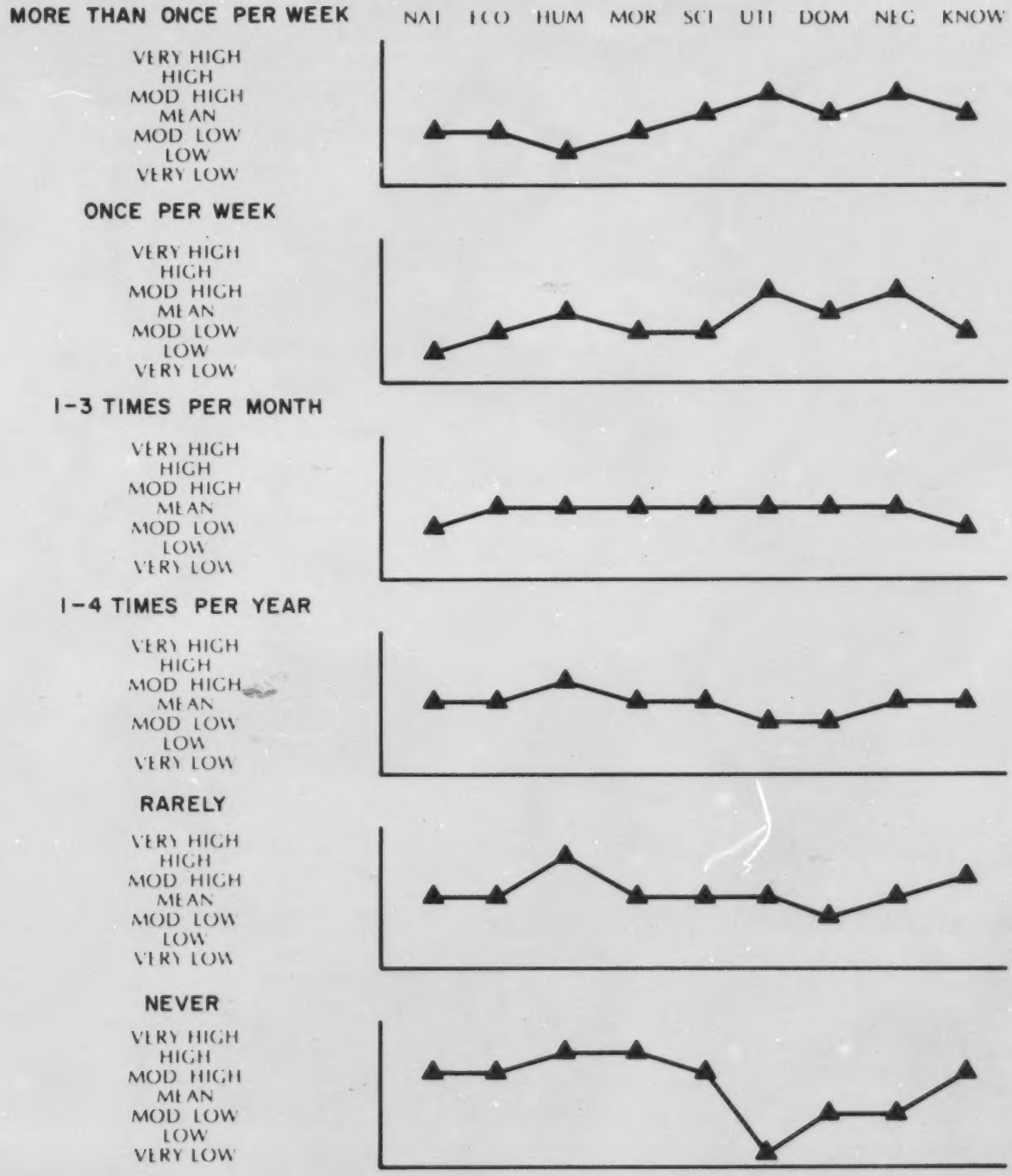


TABLE 57

ANALYSIS OF VARIANCE AND MULTIPLE CLASSIFICATION ANALYSIS FOR ATTENDANCE AT RELIGIOUS SERVICES X ATTITUDE AND KNOWLEDGE SCALES

	DEVIATION FROM GRAND MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES			
	ONCE OR MORE PER WEEK	1-3 TIMES PER MONTH	1-4 TIMES PER YEAR	RARELY OR NEVER
NATURALISTIC SIG. OF F = .001	-0.24	-0.09	0.11	0.31
ECOLOGISTIC SIG. OF F = .002	-0.19	0.02	-0.05	0.27
HUMANISTIC SIG. OF F = .000	-0.22	-0.10	0.08	0.31
MORALISTIC SIG. OF F = .000	-0.47	-0.24	0.27	0.61
SCIENTISTIC SIG. OF F = .376	-0.06	0.04	0.04	0.04
UTILITARIAN SIG. OF F = .000	0.37	0.05	-0.15	-0.43
DOMINIONISTIC SIG. OF F = .006	0.14	0.12	-0.10	-0.21
NEGATIVISTIC SIG. OF F = .043	0.16	-0.03	0.03	-0.23
KNOWLEDGE SIG. OF F = .001	-0.95	-1.22	0.00	1.96

er affective interest and cognitive understanding of animals.

Strong differences also existed in concern for the ethical treatment and exploitation of animals and their natural habitats. Specifically, those rarely or never participating in formal religious activities scored far higher on the moralistic and lower on the utilitarian scales than respondents who attended services at least once a week or more. Nonparticipants, in fact, had among the highest moralistic scores of any demographic group; an empathetic concern for the rights of animals also reflected in extremely low dominionistic scores. These protectionist differences were also reflected in significant ecologistic scale results.

Possible explanations for such strong and consistent differences in basic attitudes and knowledge of animals among varying religious participation groups are difficult to offer. Some provocative and potentially useful insights, however, have been provided by historians and philosophers such as Lynn White[9], John Passmore[10], Henry Salt[11] and others[12]. While these hypotheses vary considerably, they all suggest the importance of an anthropocentric Western religious tradition emphasizing the notion of a single God endowed with human image and characteristics, and the related belief that only man possesses the capacities for reason and immortality. Additionally, a critical historical event in the evolution of Judeo-Christian monotheism was a vigorous condemnation of animal idolatry, possibly reflected, with the exception of limited anthropomorphic moral fables, in animal stories and images being nearly absent from the theological writings of Western religion. As a consequence, the emergence of a scientific perspective asserting the fundamental communality of humans and animals was regarded with grave concern by many strong adherents of traditional religious thought. In contrast, much inspiration for various "return to nature" movements, such as the transcendentalist of the 19th century and various wilderness cults in the 20th century, have stemmed from spiritual concepts thought to be at odds with prevailing religious doctrine. While these various historical and philosophical threads do not constitute a thorough explanation, they do suggest some basis for understanding why varying religious participation groups were characterized by major differences in attitudes and knowledge toward animals.

The results clearly indicate the need for greater management recognition and understanding of the religious factor, particularly in situations where major land-use decisions affect regions of strong and traditional religious activity. This represents a sensitive and potentially controversial consideration, but its avoidance may invite public conflict and support problems.

OCCUPATION

Differences among occupational groups were difficult to assess, lacking the consistency and strength found for other demographic variables. Analysis of variance results also indicated that many significant occupation cross-tabulational findings were insignificant when taking other demographic factors into account (Table 58). On the humanistic, naturalistic, knowledge and moralistic scales, in particular, occupational group differences appeared to be largely attributable to the influence of education, income, and sex. Humanistic and moralistic differences, for example, were primarily related to the greater proportion of females in service and clerical occupations, while naturalistic and knowledge scale results appeared to be a consequence of the greater frequency of college educated respondents among professional, managerial, and student groups.

One occupational group which did stand out prominently was farmers. This group was especially characterized by non-emotional pragmatism and mastery-over-nature attitudes, as reflected in very high scores on the utilitarian and dominionistic scales (in fact, the highest utilitarian and second highest dominionistic scores of any demographic group) (Figure 27). Additionally, a pronounced lack of sympathy for most cruelty and animal protection concerns among farmers was suggested by extremely low moralistic and endangered species protection scale scores (lower than all groups on these scales except respondents with less than an eighth grade education and over 76 years of age).

Farmers also expressed limited interest in wildlife, the outdoors, or animals in general, as indicated by relatively low naturalistic, knowledge and high negativistic scores. Finally, a somewhat emotionally detached view of animals, particularly pets, was suggested by humanistic scores lower than any other demographic group.

The limited interest and concern among farmers for animals is perhaps indicative of major difficulties that would be encountered in trying to promote effective wildlife management on one of our countries most important private lands. At a time of increasing pressure for monocultural farming and agricultural conversion of marginal habitat, new incentives and methods may have to be developed to enhance greater appreciation and a more protectionist ethic toward wildlife among farmers.

ATTITUDE SCALE COMPARISONS ACROSS ALL DEMOGRAPHIC GROUPS

This last section briefly summarizes the attitude scale results by citing the

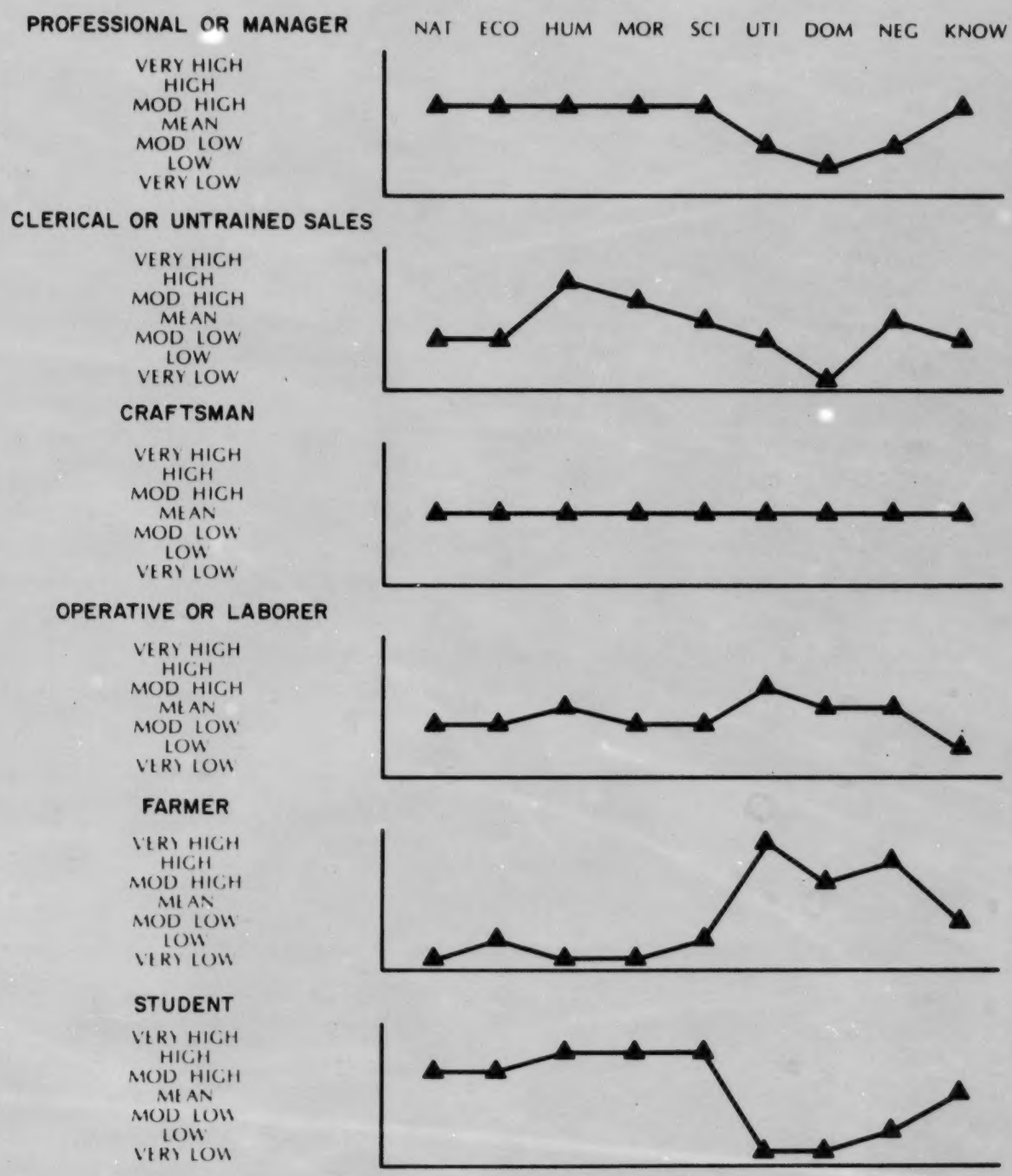
TABLE 58

ANALYSIS OF VARIANCE AND MULTIPLE CLASSIFICATION ANALYSIS FOR SELECTED OCCUPATION GROUPS X ATTITUDE SCALES

	PROFESSIONAL OR MANAGERS	CLERICAL OR UNTRAINED SALES	CRAFTSMEN	OPERATIVES	FARMERS
NATURALISTIC SIG. OF F = .599	0.00	-0.44	-0.12	-0.26	-0.30
ECOLOGISTIC SIG. OF F = .127	0.31	-0.05	-0.12	-0.32	-0.03
HUMANISTIC SIG. OF F = .111	0.18	0.16	0.00	-0.31	-0.90
MORALISTIC SIG. OF F = .103	0.31	1.37	0.29	0.32	-0.94
SCIENTISTIC SIG. OF F = .721	0.03	-0.10	0.05	-0.17	0.05
UTILITARIAN SIG. OF F = .006	-0.09	-0.49	-0.42	0.46	2.11
DOMINIONISTIC SIG. OF F = .095	-0.16	-0.36	-0.20	-0.19	0.66
NEGATIVISTIC SIG. OF F = .695	-0.18	-0.12	0.13	0.10	0.30

FIGURE 27

OCCUPATION BY SELECTED KNOWLEDGE AND ATTITUDE SCALES



very highest and lowest scoring demographic groups on each of the scales from among the 75 examined.

The results of Figure 28 and Table 59 indicate the demographic groups with the highest naturalistic scores included respondents with a graduate or college education, persons between 18 and 35 years of age, Alaska and Pacific Coast residents, and those who rarely or never participated in formal religious services. In contrast, the lowest naturalistic scores were obtained by blacks, respondents with less than an 11th grade education, persons over 56 years of age, and those employed in clerical and service occupations.

A somewhat similar pattern was found on the ecologistic scale (Figure 29 and Table 60) with additionally high scoring groups including persons employed in professional and managerial occupations, males, and residents of areas of less than 2,000 population. On the other hand, very low ecologistic scores were characteristic of unskilled blue collar workers, the elderly, poorly educated respondents and blacks.

The highest scoring groups on the humanistic scale (Figure 30 and Table 61) included respondents between 18 and 25, those of high incomes, females, persons who rarely or never attended religious services and Pacific Coast residents. In contrast, people residing in highly rural areas, Alaskans, males, the elderly and farmers revealed the least humanistic concern for animals.

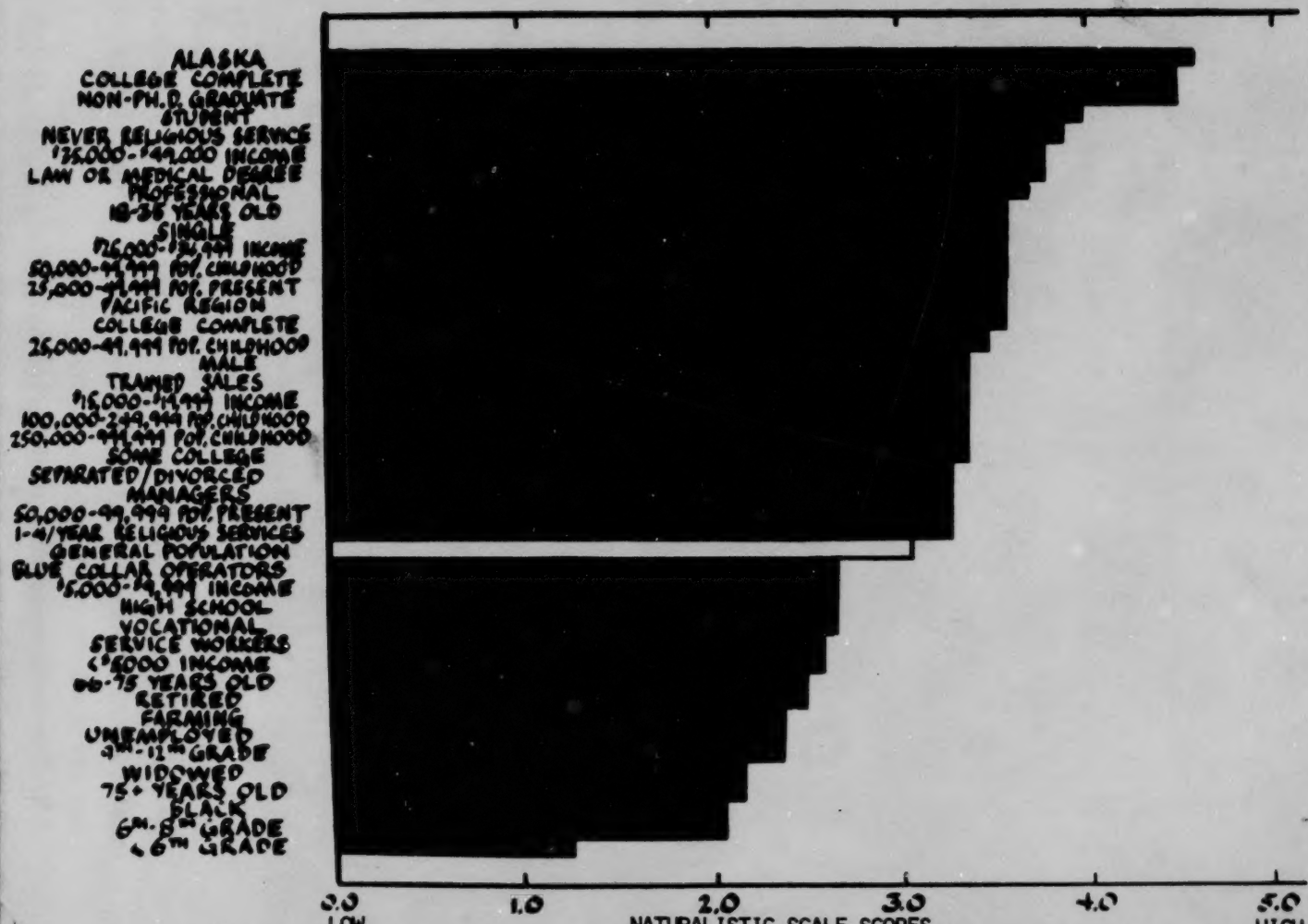
Very high moralistic scores (Figure 31 and Table 62) were characteristic of Pacific Coast residents, clerical workers, respondents with a graduate school education, females, nonparticipants in religious services and persons less than 35 years old. In considerable contrast, very low moralistic scores occurred among residents of the South, Alaska and highly rural areas, males and farmers.

A scientistic attitude toward animals (Figure 32 and Table 63) was most evident among persons with a college education, respondents between 18 and 25, single persons and Alaska residents. On the other hand, very low scientistic scores were obtained by the elderly, the poorly educated, blue collar workers and, ironically, residents of the most rural and urban areas.

The most pronounced utilitarian attitudes (Figure 33 and Table 64) were characteristic of farmers, elderly respondents, blacks, those with less than a sixth grade education and residents of the South. In contrast, the lowest utilitarian scores occurred among respondents less than 25 years old, the highly educated, single persons, residents of Alaska and, somewhat paradoxically, of areas with greater than one million population.

FIGURE 28

NATURALISTIC SCALE MEANS BY SELECTED DEMOGRAPHIC GROUPS*



*ATTITUDE SCALE MEANS BY SELECTED DEMOGRAPHIC GROUPS (FIGURES 28-35) DO NOT TAKE INTO ACCOUNT THE CONFOUNDING EFFECTS OF DIFFERENT VARIABLES. MULTIPLE CLASSIFICATION ANALYSIS RESULTS (TABLES 59-66), HOWEVER, DO SOMEWHAT ADJUST FOR THESE INTERRELATIONSHIPS.

TABLE 59

NATURALISTIC SCALE

MULTIPLE CLASSIFICATION ANALYSIS RESULTS:

15 LARGEST POSITIVE AND NEGATIVE DEVIATIONS FROM OVERALL SAMPLE MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES

LARGEST POSITIVE		LARGEST NEGATIVE	
GRADUATE EDUCATION	1.13	BLACK	-0.87
ALASKA	0.85	< 8TH GRADE EDUCATION	-0.61
18-25 YEARS OLD	0.52	9-11TH GRADE EDUCATION	-0.54
26-35 YEARS OLD	0.36	56-75 YEARS OLD	-0.54
COLLEGE EDUCATION	0.36	76 + YEARS OLD	-0.49
PACIFIC REGION	0.31	CLERICAL WORKERS	-0.44
RARELY OR NEVER RELIGIOUS ATTENDANCE	0.31	SOUTHERN REGION	-0.30
$35,000 + ANNUAL INCOME	0.29	FARMERS	-0.30
MALE	0.29	1 MILLION + POPULATION OF RESIDENCE	-0.27
< 500 POPULATION OF RESIDENCE	0.27	BLUE COLLAR OPERATIVES	-0.26
500-1,999 POPULATION OF RESIDENCE	0.25	ONCE OR MORE PER WEEK RELIGIOUS ATTENDANCE	-0.24
ROCKY MOUNTAIN REGION	0.19	FEMALE	-0.22
NORTHCENTRAL REGION	0.19	NORTHEAST REGION	-0.21
SINGLE	0.12	HIGH SCHOOL OR VOC/TECH EDUCATION	-0.20
10,000-50,000 POPULATION OF RESIDENCE	0.11	CRAFTSMEN	-0.12

FIGURE 29

ECOLOGISTIC SCALE MEANS BY SELECTED DEMOGRAPHIC GROUPS 1978 NATIONAL SAMPLE

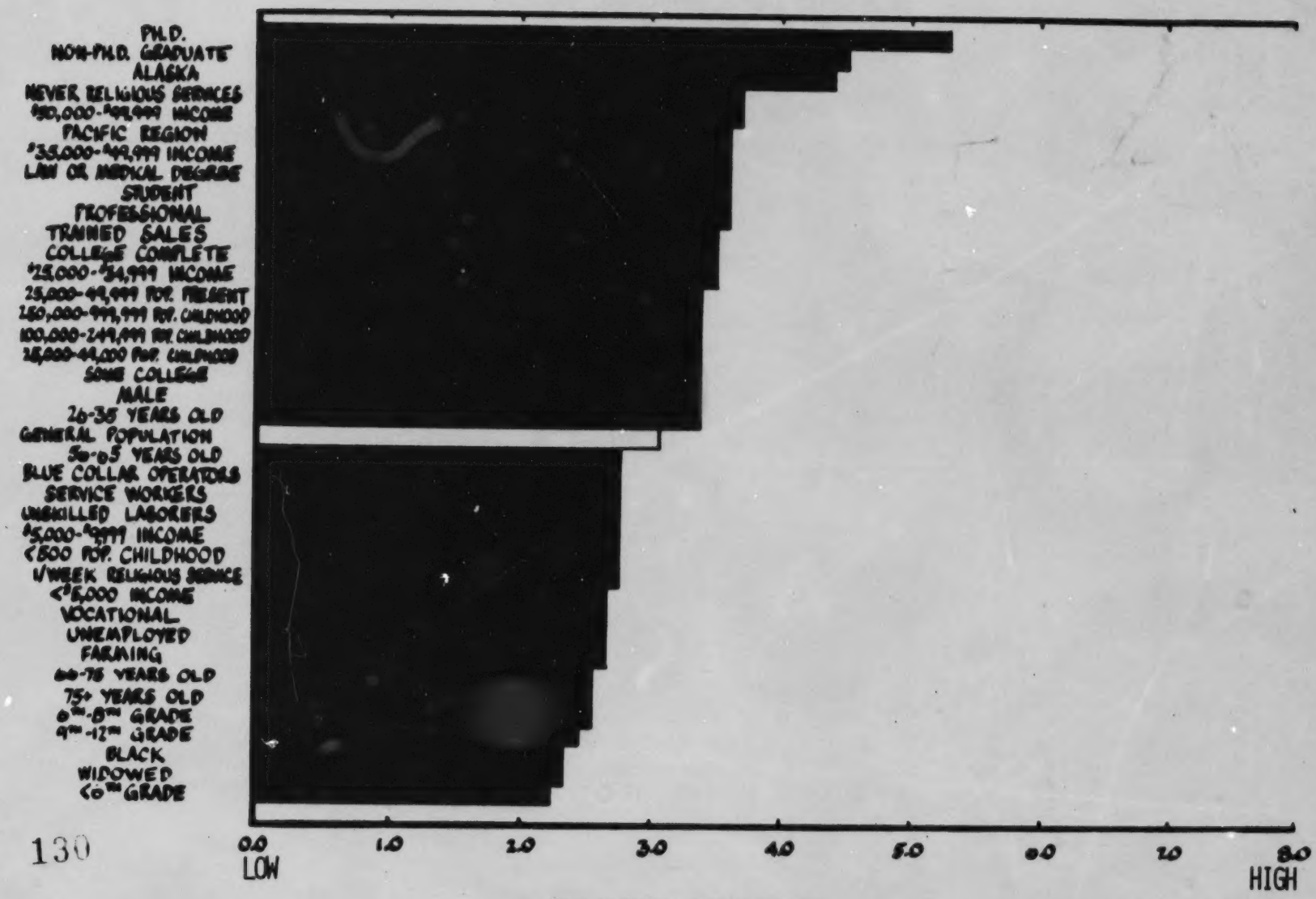


TABLE 60

ECOLOGISTIC SCALE
MULTIPLE CLASSIFICATION ANALYSIS RESULTS:
15 LARGEST POSITIVE AND NEGATIVE DEVIATIONS FROM OVERALL SAMPLE MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES

LARGEST POSITIVE		LARGEST NEGATIVE	
GRADUATE EDUCATION	1.38	BLACK	-0.62
ALASKA	0.94	9-11TH GRADE EDUCATION	-0.58
PROFESSIONAL OR MANAGER	0.31	<8TH GRADE EDUCATION	-0,35
RARELY OR NEVER RELIGIOUS ATTENDANCE	0.27	BLUE COLLAR OPERATIVES	-0.32
MALE	0.27	56-75 YEARS OLD	-0.29
500-1,999 POPULATION OF RESIDENCE	0.24	HIGH SCHOOL OR VOC/TECH EDUCATION	-0.21
PACIFIC REGION	0.24	FEMALE	-0.20
COLLEGE EDUCATION	0.24	ONCE OR MORE PER WEEK RELIGIOUS ATTENDANCE	-0.19
$35,000 + ANNUAL INCOME	0.20	NORTHEAST REGION	-0.13
<500 POPULATION OF RESIDENCE	0.20	CRAFTSMEN	-0.12
36-55 YEARS OLD	0.12	SOUTHERN REGION	-0.11
26-35 YEARS OLD	0.10	250,000-999,999 POPULATION OF RESIDENCE	-0.10
18-25 YEARS OLD	0.07	2,000-9,999 POPULATION OF RESIDENCE	-0.09
WHITE	0.06	76 + YEARS OLD	-0.08
$20,000-34.999 ANNUAL INCOME	0.05	10,000-49,999 POPULATION OF RESIDENCE	-0.05
		CLERICAL WORKERS	-0.05
		SINGLE	-0.05

FIGURE 30

HUMANISTIC SCALE MEANS BY SELECTED DEMOGRAPHIC GROUPS 1978 NATIONAL SAMPLE

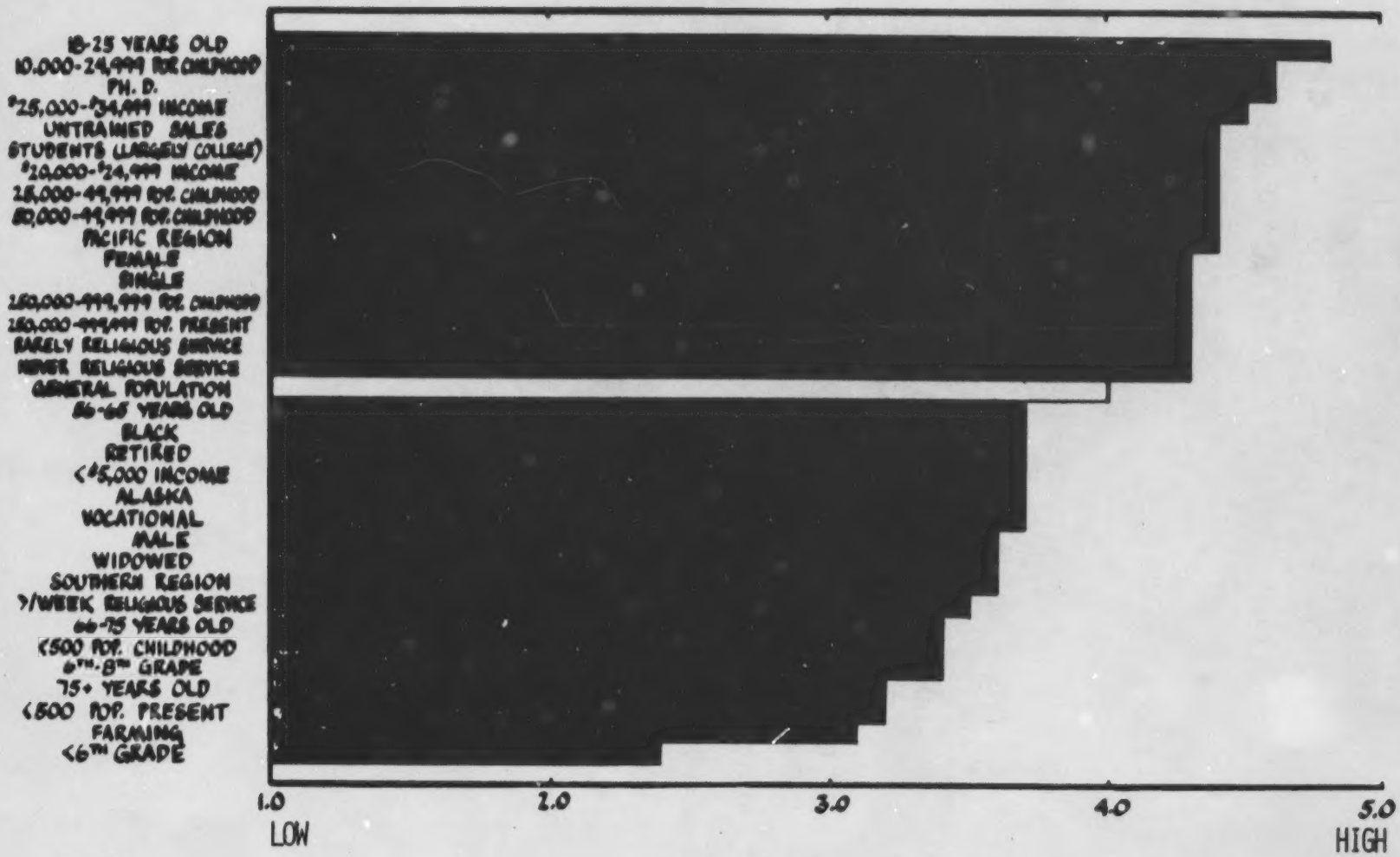


TABLE 61

HUMANISTIC SCALE

MULTIPLE CLASSIFICATION ANALYSIS RESULTS:

15 LARGEST POSITIVE AND NEGATIVE DEVIATIONS FROM OVERALL SAMPLE MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES

LARGEST POSITIVE		LARGEST NEGATIVE	
18-25 YEARS OLD	0.71	FARMERS	-0.90
$20,000-34,999 ANNUAL INCOME	0.36	76 + YEARS OLD	-0.67
FEMALE	0.33	ALASKA	-0.58
RARELY OR NEVER RELIGIOUS ATTENDANCE	0.31	MALE	-0.45
PACIFIC REGION	0.27	<500 POPULATION OF RESIDENCE	-0.42
250,000-999,999 POPULATION OF PRESENT RESIDENCE	0.20	56-75 YEARS OLD	-0.37
PROFESSIONAL OR MANAGER	0.18	BLACK	-0.32
NORTHEAST REGION	0.17	SOUTHERN REGION	-0.31
CLERICAL WORKERS	0.16	BLUE COLLAR OPERATIVES	-0.31
26-35 YEARS OLD	0.16	<8TH GRADE EDUCATION	-0.27
COLLEGE EDUCATION	0.08	ONCE OR MORE PER WEEK RELIGIOUS ATTENDANCE	-0.22
1-4 TIMES PER YEAR RELIGIOUS ATTENDANCE	0.08	36-55 YEARS OLD	-0.15
ROCKY MOUNTAIN REGION	0.07	1-3 TIMES PER MONTH RELIGIOUS ATTENDANCE	-0.10
SINGLE	0.07	1 MILLION + POPULATION OF RESIDENCE	-0.06
NORTHCENTRAL REGION	0.04	2,000-9,999 POPULATION OF RESIDENCE	-0.05
		$10,000-19,999 ANNUAL INCOME	-0.05

FIGURE 31

MORALISTIC SCALE MEANS BY SELECTED DEMOGRAPHIC GROUPS 1978 NATIONAL SAMPLE

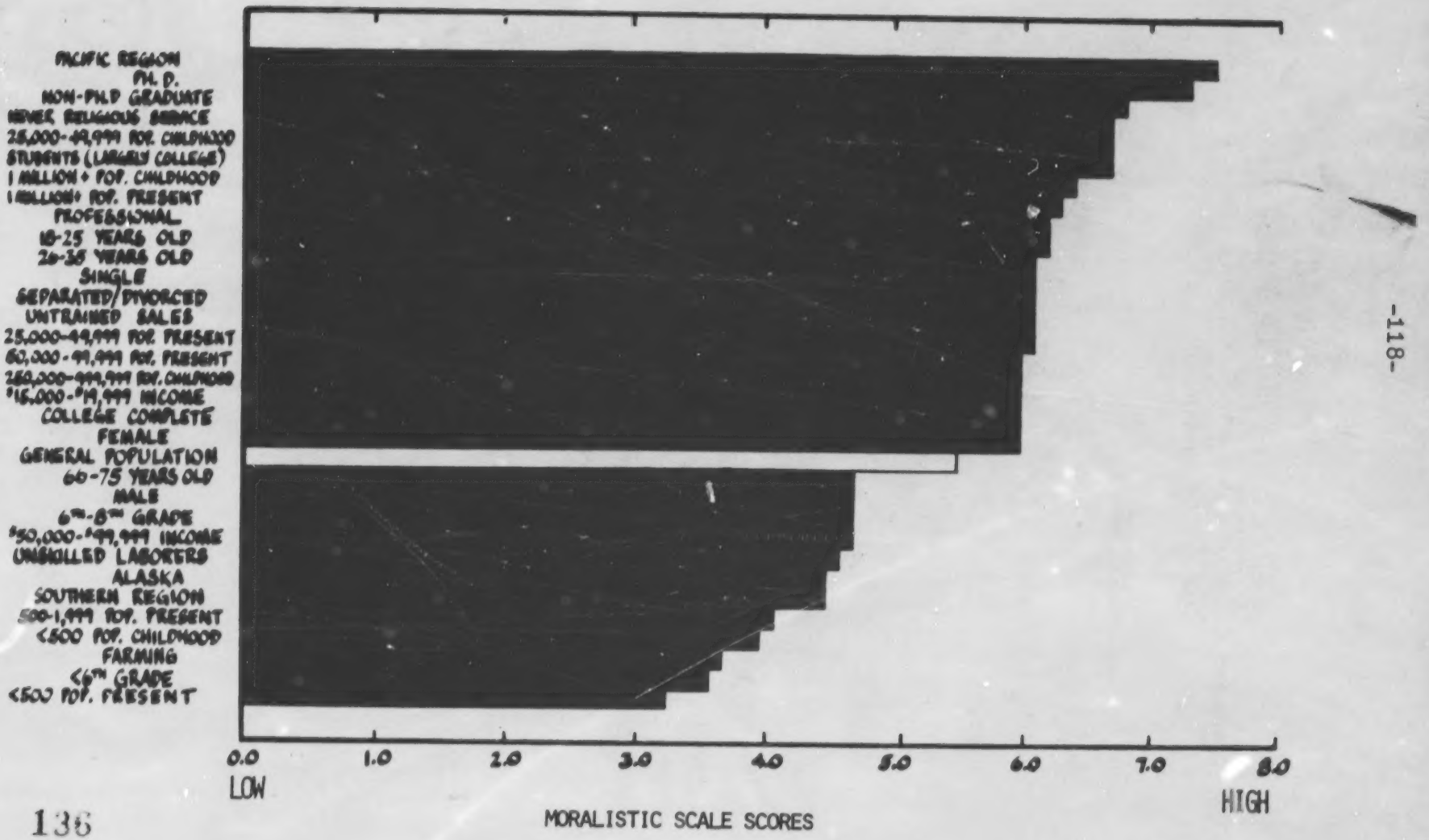


TABLE 62

MORALISTIC SCALE

MULTIPLE CLASSIFICATION ANALYSIS RESULTS:

15 LARGEST POSITIVE AND NEGATIVE DEVIATIONS FROM OVERALL SAMPLE MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES

LARGEST POSITIVE		LARGEST NEGATIVE	
PACIFIC REGION	1.59	<500 POPULATION OF RESIDENCE	-1.50
CLERICAL WORKERS	1.37	ALASKA	-1.38
GRADUATE EDUCATION	1.32	FARMERS	-0.94
FEMALE	0.64	MALE	-0.86
RARELY OR NEVER RELIGIOUS ATTENDANCE	0.61	500-1,999 POPULATION OF RESIDENCE	-0.83
26-35 YEARS OLD	0.49	SOUTHERN REGION	-0.80
18-25 YEARS OLD	0.44	76 + YEARS OLD	-0.53
SINGLE	0.40	9-11TH GRADE EDUCATION	-0.49
1 MILLION + POPULATION OF RESIDENCE	0.38	ONCE OR MORE PER WEEK RELIGIOUS ATTENDANCE	-0.47
COLLEGE EDUCATION	0.36	ROCKY MOUNTAIN REGION	-0.46
BLUE COLLAR OPERATIVES	0.32	$35,000 + ANNUAL INCOME	-0.34
PROFESSIONAL OR MANAGER	0.31	HIGH SCHOOL OR VOC/TECH EDUCATION	-0.33
CRAFTSMEN	0.29	BLACK	-0.33
1-4 TIMES PER YEAR RELIGIOUS ATTENDANCE	0.27	36-55 YEARS OLD	-0.32
$20,000-34,999 ANNUAL INCOME	0.23	56-75 YEARS OLD	-0.30

FIGURE 32

SCIENTISTIC SCALE MEANS BY SELECTED DEMOGRAPHIC GROUPS 1978 NATIONAL SAMPLE

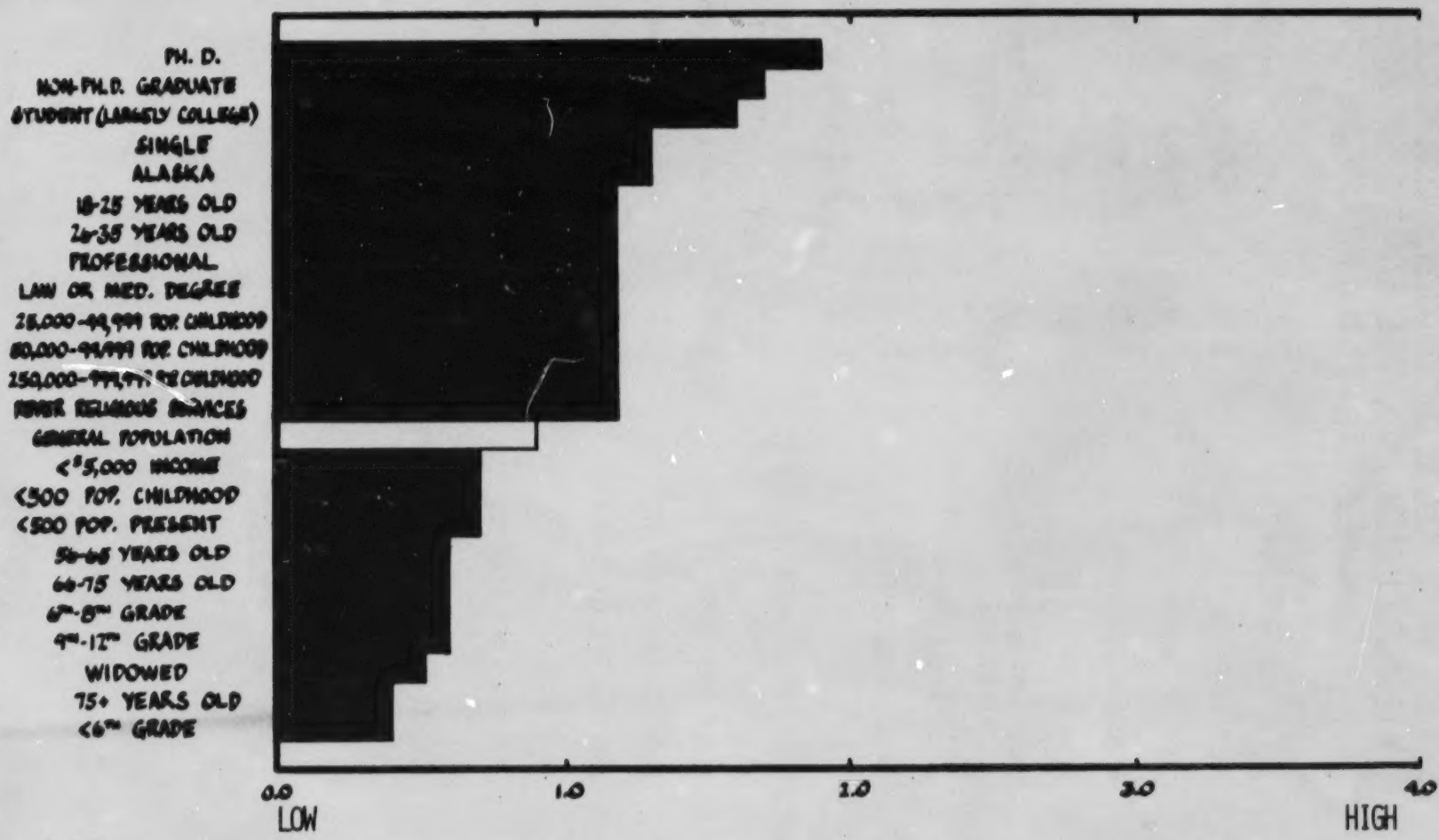


TABLE 63

SCIENTISTIC SCALE
MULTIPLE CLASSIFICATION ANALYSIS RESULTS:
15 LARGEST POSITIVE AND NEGATIVE DEVIATIONS FROM OVERALL SAMPLE MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES

LARGEST POSITIVE		LARGEST NEGATIVE	
GRADUATE EDUCATION	0.83	76 + YEARS OLD	-0.38
18-25 YEARS OLD	0.30	56-75 YEARS OLD	-0.30
26-35 YEARS OLD	0.28	9-11TH GRADE EDUCATION	-0.22
SINGLE	0.22	<8TH GRADE EDUCATION	-0.21
COLLEGE EDUCATION	0.17	HIGH SCHOOL OR VOC/TECH EDUCATION	-0.19
ALASKA	0.10	BLUE COLLAR OPERATIVES	-0.17
36-55 YEARS OLD	0.10	<500 POPULATION OF RESIDENCE	-0.11
500-1,999 POPULATION OF RESIDENCE	0.10	1 MILLION + POPULATION OF RESIDENCE	-0.11
PACIFIC REGION	0.08	ROCKY MOUNTAIN REGION	-0.11
10,000-49,999 POPULATION OF RESIDENCE	0.07	CLERICAL WORKERS	-0.10
FARMERS	0.05	ONCE OR MORE PER WEEK RELIGIOUS ATTENDANCE	-0.06
CRAFTSMEN	0.05	MARRIED	-0.06
2,000-9,999 POPULATION OF RESIDENCE	0.04	BLACK	-0.06
1-3 TIMES PER MONTH RELIGIOUS ATTENDANCE	0.04	50,000-249,999 POPULATION OF RESIDENCE	-0.03
1-4 TIMES PER YEAR RELIGIOUS ATTENDANCE	0.04	SOUTHERN REGION	-0.03
RARELY OR NEVER RELIGIOUS ATTENDANCE	0.04	FEMALE	-0.03
MALE	0.04		

FIGURE 33

UTILITARIAN SCALE MEANS BY SELECTED DEMOGRAPHIC GROUPS 1978 NATIONAL SAMPLE

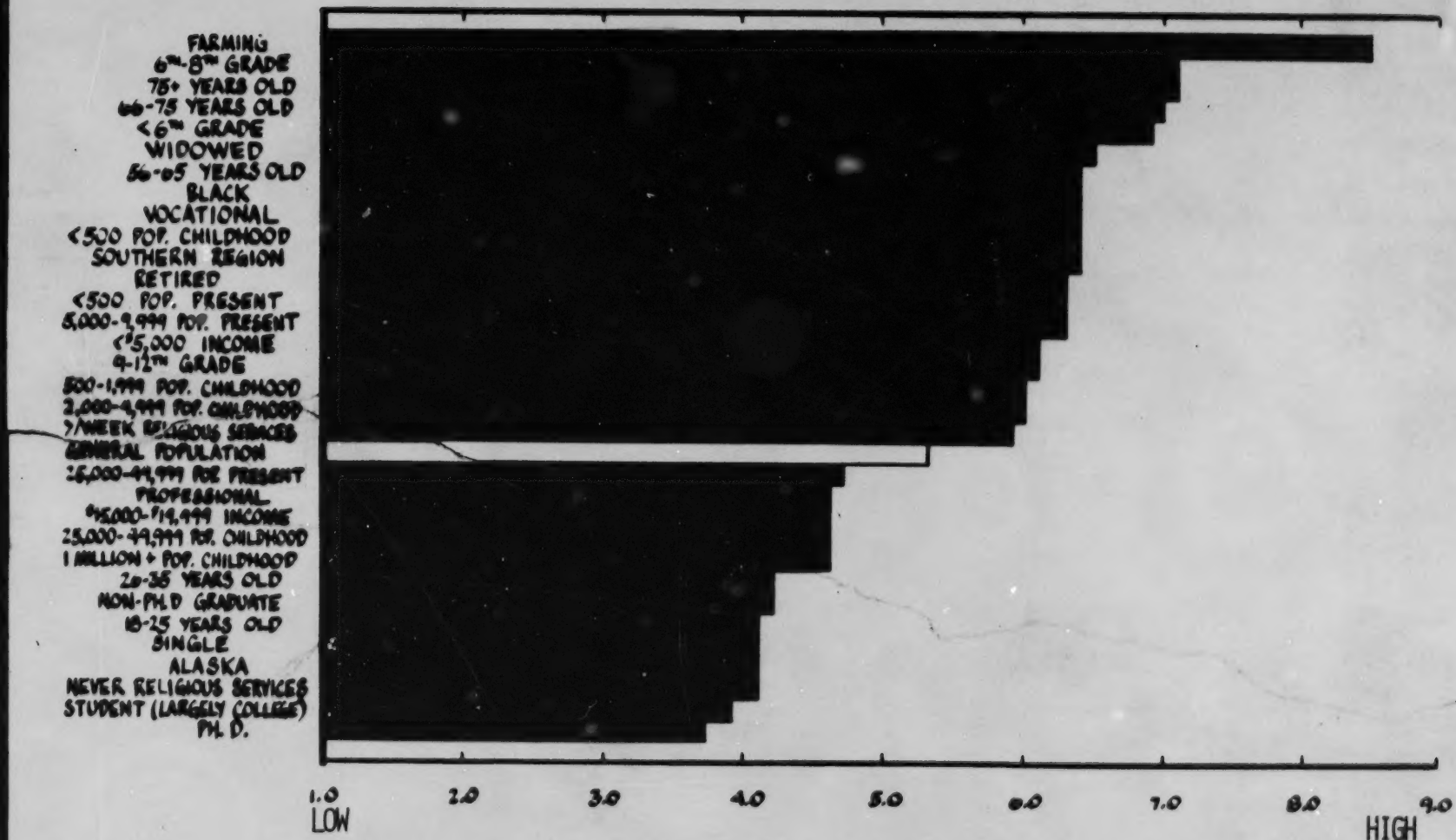


TABLE 64

UTILITARIAN SCALE
MULTIPLE CLASSIFICATION ANALYSIS RESULTS:
15 LARGEST POSITIVE AND NEGATIVE DEVIATIONS FROM OVERALL SAMPLE MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES

LARGEST POSITIVE		LARGEST NEGATIVE	
FARMERS	2.11	18-25 YEARS OLD	-1.14
76 + YEARS OLD	1.43	26-35 YEARS OLD	-0.88
56-75 YEARS OLD	1.15	GRADUATE EDUCATION	-0.85
BLACK	1.13	ALASKA	-0.70
SOUTHERN REGION	0.88	SINGLE	-0.61
<8TH GRADE EDUCATION	0.87	1 MILLION + POPULATION OF RESIDENCE	-0.45
MALE	0.48	CLERICAL WORKERS	-0.44
BLUE COLLAR OPERATIVES	0.46	NORTHCENTRAL REGION	-0.43
2,000-9,999 POPULATION OF RESIDENCE	0.44	RARELY OR NEVER RELIGIOUS ATTENDANCE	-0.43
ONCE OR MORE PER WEEK RELIGIOUS ATTENDANCE	0.37	CRAFTSMEN	-0.42
<500 POPULATION OF RESIDENCE	0.32	FEMALE	-0.36
9-11TH GRADE EDUCATION	0.31	$10,000-19,999 ANNUAL INCOME	-0.36
36-55 YEARS OLD	0.26	NORTHEAST REGION	-0.35
$35,000 + ANNUAL INCOME	0.25	COLLEGE EDUCATION	-0.29
$0-9,999 ANNUAL INCOME	0.19	ROCKY MOUNTAIN REGION	-0.22

Very high scoring groups on the dominionistic scale (Figure 34 and Table 65) included males, farmers, residents of Alaska and the Rocky Mountain states and respondents with high incomes. In contrast, the lowest dominionistic scores were obtained by Pacific Coast residents, females, those with a graduate education, clerical workers and persons who rarely or never participated in religious services.

Finally, very high negativistic scale scores (Figure 35 and Table 66) occurred among elderly respondents, the poorly educated, females and blacks. In marked contrast, residents of highly rural areas, Alaskans, males, respondents between 18 and 25 and the college educated had exceptionally low scores on this scale.

CONCLUSION

Throughout the course of this study, a guiding premise has been the need to improve our understanding of the values, knowledge and concerns of Americans toward animals and natural habitats in order to manage the wildlife resource in a more effective and efficient manner. At a time of increasing public interest and involvement in various management issues, it has become more apparent that the success or failure of many programs will depend on a better appreciation of public wildlife values and needs. Moreover, as Americans are increasingly asked to render substantial social and economic sacrifices for the sake of protecting wildlife and associated habitat, the delineation of realistic regulatory priorities will require a better assessment of public attitudes. Finally, as the constituency of the Fish and Wildlife Service continues to shift or, at least, expand to include many non-traditional groups, more equitable and efficient services will necessitate additional people-oriented knowledge. The need and challenge for more human dimensions data are, thus, great and the present effort represents but a fledgling start.

FIGURE 34

DOMINIONISTIC SCALE MEANS BY SELECTED DEMOGRAPHIC GROUPS 1978 NATIONAL SAMPLE

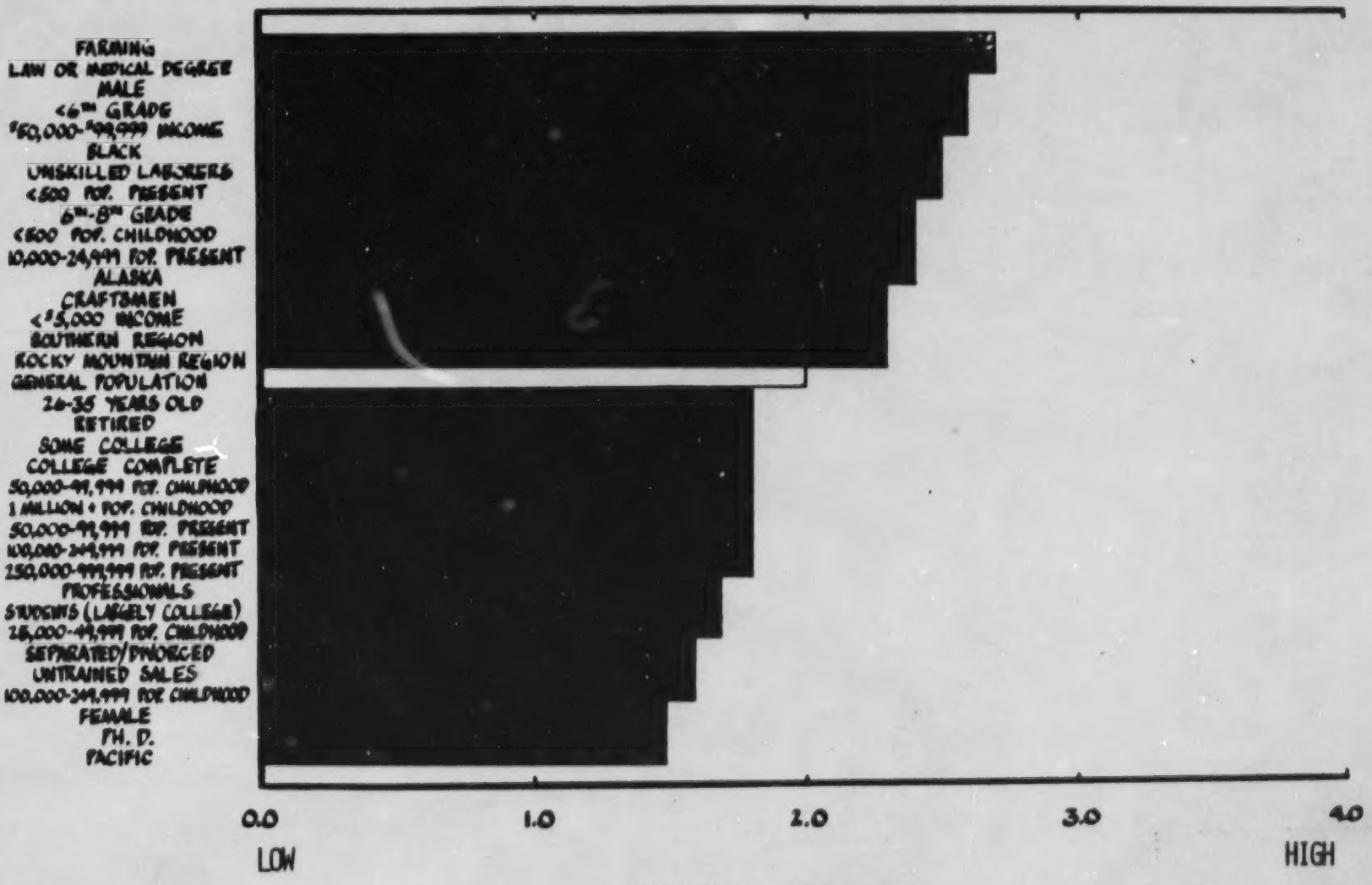


TABLE 65

DOMINIONISTIC SCALE

MULTIPLE CLASSIFICATION ANALYSIS RESULTS:

15 LARGEST POSITIVE AND NEGATIVE DEVIATIONS FROM OVERALL SAMPLE MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES

LARGEST POSITIVE		LARGEST NEGATIVE	
MALE	0.68	PACIFIC	-0.55
FARMERS	0.66	FEMALE	-0.51
ALASKA	0.43	GRADUATE EDUCATION	-0.45
ROCKY MOUNTAIN REGION	0.37	CLERICAL WORKERS	-0.36
$35,000 + ANNUAL INCOME	0.23	RARELY OR NEVER RELIGIOUS ATTENDANCE	-0.21
76 + YEARS OLD	0.22	CRAFTSMEN	-0.20
SOUTHERN REGION	0.22	BLUE COLLAR OPERATIVES	-0.19
<8TH GRADE EDUCATION	0.20	500-1,999 POPULATION OF RESIDENCE	-0.16
2,000-9,999 POPULATION OF RESIDENCE	0.17	50,000-249,999 POPULATION OF RESIDENCE	-0.16
10,000-49,999 POPULATION OF RESIDENCE	0.16	250,000-999,999 POPULATION OF RESIDENCE	-0.16
9-11TH GRADE EDUCATION	0.14	PROFESSIONAL OR MANAGER	-0.16
ONCE OR MORE PER WEEK RELIGIOUS ATTENDANCE	0.14	COLLEGE EDUCATION	-0.13
1-3 TIMES PER MONTH RELIGIOUS ATTENDANCE	0.12	NORTHEAST REGION	-0.11
<500 POPULATION OF RESIDENCE	0.12	1-4 TIMES PER YEAR RELIGIOUS ATTENDANCE	-0.10
HIGH SCHOOL OR VOC/TECH EDUCATION	0.11	18-25 YEARS OLD	-0.08
36-55 YEARS OLD	0.11		

FIGURE 35

NEGATIVISTIC SCALE MEANS BY SELECTED DEMOGRAPHIC GROUPS 1978 NATIONAL SAMPLE

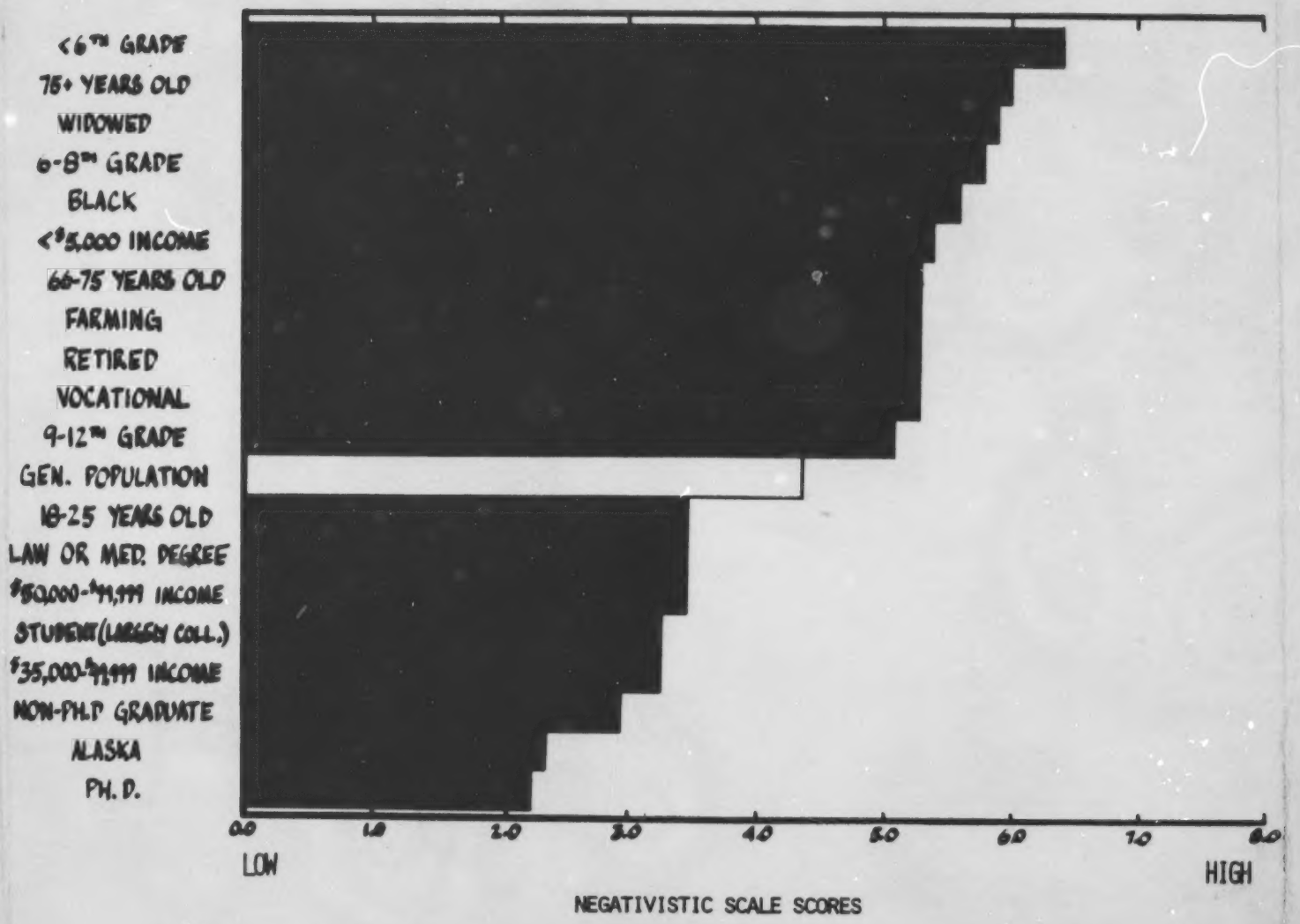


TABLE 66

NEGATIVISTIC SCALE

MULTIPLE CLASSIFICATION ANALYSIS RESULTS:
15 LARGEST POSITIVE AND NEGATIVE DEVIATIONS FROM OVERALL SAMPLE MEAN AFTER ADJUSTING FOR INDEPENDENT AND COVARIATE VARIABLES

LARGEST POSITIVE		LARGEST NEGATIVE	
BLACK	1.08	ALASKA	-1.16
<8TH GRADE EDUCATION	0.95	GRADUATE EDUCATION	-0.99
76 + YEARS OLD	0.74	18-25 YEARS OLD	-0.69
FEMALE	0.51	MALE	-0.68
56-75 YEARS OLD	0.50	<500 POPULATION OF RESIDENCE	-0.59
9-11TH GRADE EDUCATION	0.33	$35,000 ANNUAL INCOME	-0.52
SOUTHERN REGION	0.33	500-1,999 POPULATION OF RESIDENCE	-0.49
FARMERS	0.30	26-35 YEARS OLD	-0.45
2,000-9,999 POPULATION OF RESIDENCE	0.29	COLLEGE EDUCATION	-0.38
36-55 YEARS OLD	0.25	PACIFIC REGION	-0.29
$0-9,999 ANNUAL INCOME	0.24	SINGLE	-0.23
250,000-999,999 POPULATION OF RESIDENCE	0.19	RARELY OR NEVER RELIGIOUS ATTENDANCE	-0.23
NORTHCENTRAL REGION	0.18	$20,000-34,999 ANNUAL INCOME	-0.21
HIGH SCHOOL OR VOC/TECH EDUCATION	0.18	ROCKY MOUNTAIN REGION	-0.20
ONCE OR MORE PER WEEK RELIGIOUS ATTENDANCE	0.16	PROFESSIONAL OR MANAGER	-0.18

APPENDIX I: ATTITUDE SCALE METHODOLOGY

Previous studies determined the existence of a typology of basic attitudes toward animals, briefly defined on page 42 and more thoroughly in other publications.[13] The initial typology was developed on the basis of a content analysis of open-ended interviews with a relatively small (N=67) but diverse group of persons directly involved with animals. The attitude classifications were, to an extent, validated by multiple discriminant function analysis, which analyzed and statistically sorted the responses of the classified respondents on a number of closed-ended questions dealing with various people/animal relationships. Because the subjects were assigned their primary attitude classifications on the basis of responses to the open-ended questions, this analysis was not tautological. The results of the analysis are indicated in Figures 36-37 and basically confirmed the validity or correctness of the classification of the respondents, as well as the relative distinctiveness and independence of the attitude types.

The attitude typology was then used as the basis for creating attitude scales in a small-scale national survey of 553 randomly distributed Americans conducted in 1975.[14] For the most part, the typology proved to be scalable and to possess differentiating ability.

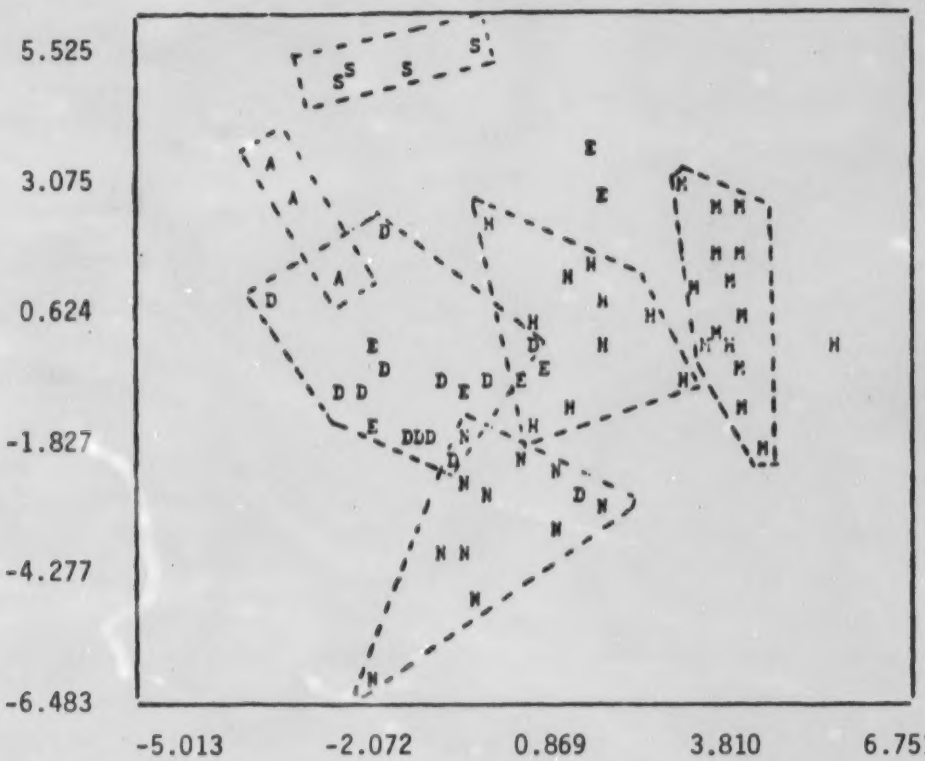
The attitude typology was again employed in the present study, although two attitude types were added -- the utilitarian and neutralistic. The former was distinguished from the dominionistic attitude, while the latter was separated from the negativistic. Over 1,000 attitude questions were considered and more than 200 pretested in determining potential attitude scale items. The final national survey yielded 69 questions used as the basis for creating eight attitude scales. These scales were developed as a result of cluster and item-to-item correlational analyses. The aesthetic attitude did not yield a valid or reliable scale. Additionally, it was not possible to distinguish the neutralistic from the negativistic attitude and, thus, only one scale resulted.

The independence of the eight attitude scales was partially assessed by correlating the scales with one another as indicated in Table 67. According to this analysis, only twice did attitude scales correlate at a level above .40. Specifically, the negativistic and naturalistic attitudes correlated at the -.42 level, while the ecologistic and naturalistic at the .405 level.

Tables 68 - 72 indicate the number of questions used to measure each attitude scale, the minimum and maximum scoring ranges, the overall national popula-

Figure 36

RESPONSE PATTERNS OF 61 ATTITUDINALLY CLASSIFIED RESPONDENTS ON TWENTY CLOSED-ENDED QUESTIONS USING MULTIPLE DISCRIMINANT FUNCTION ANALYSIS* ** ***



E = Ecologistic, H = Humanistic, M = Moralistic, S = Scientistic, A = Aesthetic, D = Dominionistic, N = Naturalistic

*The two axes on the graph are the two canonical variables which reflect the best combination of the twenty selected questionnaire variables rotated twice with one another.

**Based on further analysis, the dominionistic scale was divided into 2 scales, the dominionistic and utilitarian,and a negativistic attitude was identified.

***The letters in the graph signify individual respondents who are distributed statistically according to their patterned responses to twenty closed-ended questions. The actual letters refer to the attitude classification of these individuals based solely on a content analysis of open-ended interviews.

FIGURE 37

NUMBER OF RESPONDENTS CORRECTLY CLASSIFIED BY PRIMARY ATTITUDE ORIENTATION BASED ON 20 MOST DISCRIMINATING VARIABLES

	NATUR.	ECOLO.	HUMAN.	MORAL.	SCIEN.	AESTH.	DOMIN.
NATURALISTIC	11						
ECOLOGISTIC		9					
HUMANISTIC	(1)		9	(1)			
MORALISTIC				15			
SCIENTISTIC					4		
AESTHETIC						3	
DOMINIONISTIC							12

TABLE 67

ATTITUDE SCALE CORRELATION MATRIX

	NATURALISTIC	ECOLOGISTIC	HUMANISTIC	MORALISTIC	SCIENTISTIC	UTILITARIAN	DOMINIONISTIC	NEGATIVISTIC
NATURALISTIC		.405	.142	.339	.369	-.290	-.040	-.418
ECOLOGISTIC	.405		.027	.170	.282	-.176	.004	-.279
HUMANISTIC	.142	.027		.333	.051	-.257	-.210	-.249
MORALISTIC	.339	.170	.333		.196	-.285	-.376	-.146
SCIENTISTIC	.369	.282	.051	.196		-.190	-.045	-.272
UTILITARIAN	-.290	-.176	-.257	-.285	-.190		.320	.348
DOMINION-ISTIC	-.040	.004	-.210	-.376	-.045	.320		.113
NEGATIVISTIC	-.418	-.279	-.249	-.146	-.272	.348	.113	

TABLE 68
NUMBER OF QUESTIONS AND SCORING RANGE OF ATTITUDE SCALES

ATTITUDE	NUMBER OF QUESTIONS	SCORING RANGE
NATURALISTIC	8	0-16
ECOLOGISTIC	6	0-17
HUMANISTIC	5	0-11
MORALISTIC	9	0-20
SCIENTISTIC	6	0-18
AESTHETIC	8	0-22
UTILITARIAN	13	0-27
DOMINIONISTIC	7	0-18
NEGATIVISTIC	7	0-17

TABLE 69

ATTITUDE SCALE FREQUENCY DISTRIBUTIONS

	NATURALISTIC			ECOLOGISTIC		
SCORE	FREQUENCY	%	CUMULATIVE %	FREQUENCY	%	CUMULATIVE %
0	463	14.9	14.9	363	11.7	11.7
1	458	14.7	29.6	283	9.1	20.8
2	537	17.3	46.9	680	21.9	42.7
3	424	13.6	60.6	536	17.3	59.9
4	367	11.8	72.4	508	16.4	76.3
5	248	8.0	80.4	268	8.6	84.9
6	221	7.1	87.5	195	6.3	91.2
7	141	4.5	92.0	111	3.6	94.8
8	114	3.7	95.7	75	2.4	97.2
9	58	1.9	97.6	38	1.2	98.4
10	43	1.4	98.9	29	0.9	99.3
11	15	0.5	99.4	7	0.2	99.5
12	11	0.4	99.8	9	0.3	99.8
13	1	0.0	99.8	1	0.0	99.9
14	4	0.1	99.9	2	0.1	99.9
15	1	0.0	100.0	2	0.1	100.0
16	1	0.0	100.0			
	$\bar{X} = 3.1$*			$X = 3.1$		

*THE MEAN SCORES REPORTED HERE ARE BASED ON A CONTROLLED NATIONAL SAMPLE (I.E., WEIGHTED FOR OVER-SAMPLING IN ALASKA AND THE ROCKY MOUNTAIN STATES) OF 2455; THUS, YIELDING SLIGHTLY DIFFERENT MEAN SCORES THAN WOULD BE CALCULATED ACCORDING TO THE ABOVE UNCONTROLLED SAMPLE SIZE OF 3107

TABLE 70

ATTITUDE SCALE FREQUENCY DISTRIBUTIONS

	HUMANISTIC			MORALISTIC		
SCORE	FREQUENCY	%	CUMULATIVE %	FREQUENCY	%	CUMULATIVE %
0	318	10.2	10.2	339	10.9	10.9
1	75	2.4	12.6	263	8.5	19.4
2	500	16.1	28.7	384	12.4	31.7
3	473	15.2	44.0	305	9.8	41.6
4	427	13.7	57.7	321	10.3	51.9
5	522	16.8	74.5	243	7.8	59.7
6	247	7.9	82.5	270	8.7	68.4
7	358	11.5	94.0	179	5.8	74.2
8	77	2.5	96.5	160	5.1	79.3
9	107	3.4	99.9	112	3.6	82.9
10	1	0.0	99.9	107	3.4	86.4
11	2	0.1	100.0	77	2.5	88.8
12				89	2.9	91.7
13				50	1.6	93.3
14				62	2.0	95.3
15				25	0.8	96.1
16				41	1.3	97.4
17				20	0.6	98.1
18				39	1.3	99.3
19				4	0.1	99.5
20				17	0.5	100.0

$\bar{X} = 4.0$ $\bar{X} = 5.5$

TABLE 71
ATTITUDE SCALE FREQUENCY DISTRIBUTIONS

	SCIENTISTIC			UTILITARIAN		
SCORE	FREQUENCY	%	CUMULATIVE %	FREQUENCY	%	CUMULATIVE %
0	1613	51.9	51.9	252	8.1	8.1
1	657	21.1	73.1	319	10.3	18.4
2	494	15.9	89.0	332	10.7	29.1
3	188	6.1	95.0	309	9.9	39.0
4	87	2.8	97.8	329	10.6	49.6
5	32	1.0	98.8	283	9.1	58.7
6	21	0.7	99.5	278	8.9	67.7
7	10	0.3	99.8	217	7.0	74.6
8	2	0.1	99.9	213	6.9	81.5
9	2	0.1	100.0	153	4.9	86.4
10	1	0.0	100.0	126	4.1	90.5
11				114	3.7	94.1
12				54	1.7	95.9
13				40	1.3	97.2
14				32	1.0	98.2
15				18	0.6	98.8
16				13	0.4	99.2
17				9	0.3	99.5
18				5	0.2	99.6
19				2	0.1	99.7
20				4	0.1	99.8
21				3	0.1	99.9
22				2	0.1	100.0

$\bar{X} = 0.9$ $\quad$ $\bar{X} = 5.3$

TABLE 72
ATTITUDE SCALE FREQUENCY DISTRIBUTIONS

	DOMINIONISTIC			NEGATIVISTIC		
SCORE	FREQUENCY	%	CUMULATIVE %	FREQUENCY	%	CUMULATIVE %
0	877	28.2	28.2	185	6.0	6.0
1	675	21.7	50.0	307	9.9	15.8
2	546	17.6	67.5	448	14.4	30.3
3	375	12.1	79.6	444	14.3	44.5
4	223	7.2	86.8	475	15.3	59.8
5	168	5.4	92.2	356	11.5	71.3
6	100	3.2	95.4	309	9.9	81.2
7	64	2.1	97.5	210	6.8	88.0
8	33	1.1	98.5	170	5.5	93.5
9	21	0.7	99.2	88	2.8	96.3
10	9	0.3	99.5	51	1.6	97.9
11	9	0.3	99.8	29	0.9	98.9
12	3	0.1	99.9	20	0.6	99.5
13	3	0.1	100.0	7	0.2	99.7
14	0	0.0	100.0	6	0.2	99.9
15	1	0.0	100.0	2	0.1	100.0

$\bar{X} = 2.0$ $\bar{X} = 4.4$

tion mean score for each scale, and the frequency response on each attitude scale score. The smallest scale, consisting of five items, was the humanistic, with a scoring range of 0 to 11, while the largest was the utilitarian, comprised of 13 items with a scoring range from 0 to 27.

APPENDIX II

NATIONAL SURVEY COMPLETION RATES

TABLE 73
RESPONSE RATES

RESPONSE RATES MINUS VACANTS

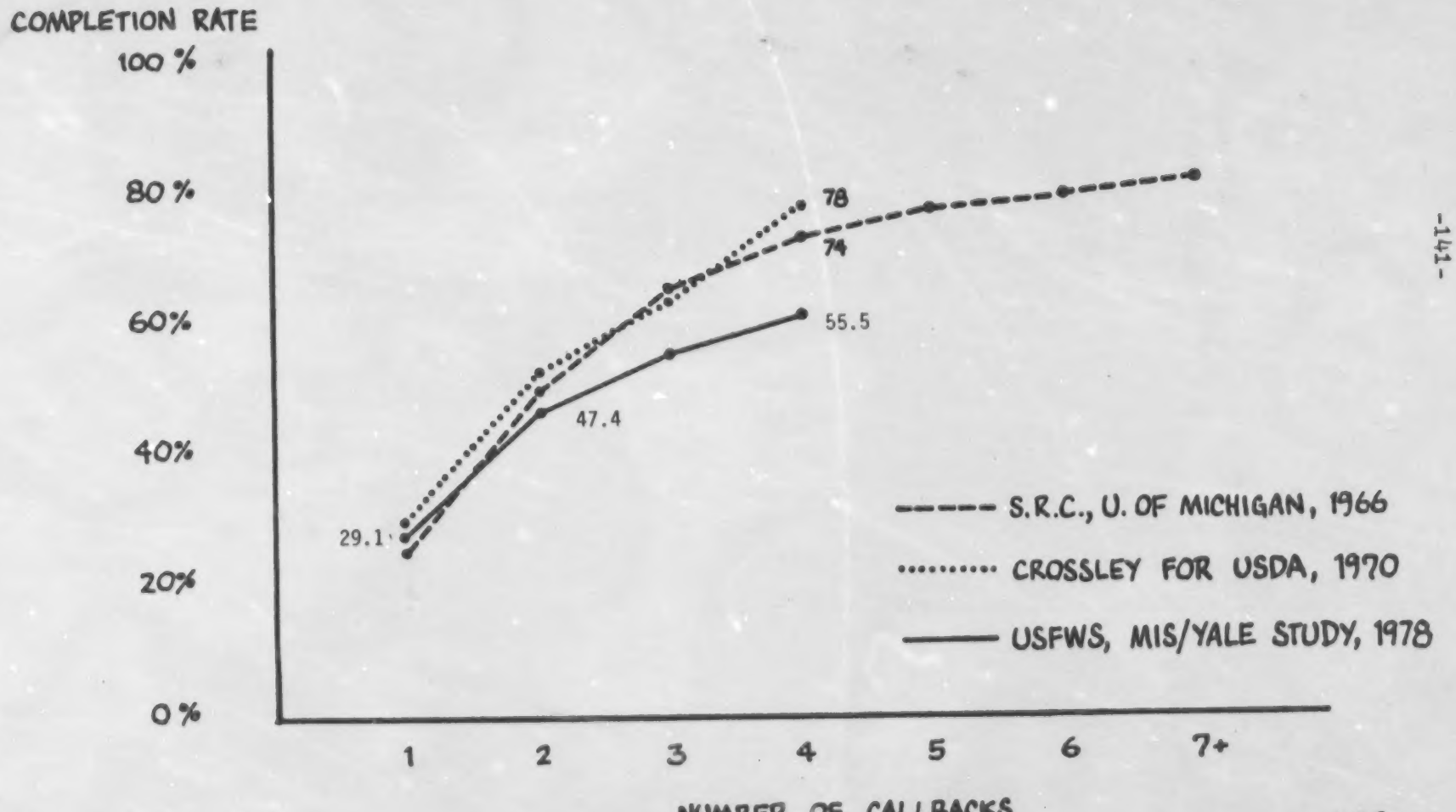
	COMPLETED INTERVIEWS	%	REFUSALS	%	NOT AT HOME	%	INCOMPLETE INTERVIEWS	%	TOTAL
NORTHEAST	557	58.4	212	22.2	109	11.4	75	7.9	953
NORTH CENTRAL	511	63.6	181	22.5	98	12.2	13	1.6	803
SOUTH	795	63.5	269	21.5	180	14.4	8	0.6	1,252
WEST	372	54.9	182	26.8	100	14.7	24	3.5	678
SPECIAL WESTERN	524	61.1	163	19.0	118	13.6	53	6.2	858
TOTAL	2,759	60.7	1,007	22.2	605	13.3	173	3.8	4,544

COMPLETIONS BY ATTEMPTS

	1ST	2ND	3RD	4TH
TOTAL OF 2759	47.9	30.1	13.3	8.7
PERCENT OF ATTEMPTED INTERVIEWS	29.1	18.3	8.1	5.2

FIGURE 38

COMPLETION RATE BY NUMBER OF CALLBACKS, THREE NATIONAL SURVEYS: 1966, 1970, 1978



APPENDIX III

COMPARISON OF DEMOGRAPHIC CHARACTERISTICS OF NATIONAL SAMPLE WITH U.S. CENSUS DATA

TABLE 74

NATIONAL SURVEY 1978 DEMOGRAPHIC INFORMATION COMPARED TO 1976 U.S. CENSUS DATA: AGE, SEX, RACE

	CENSUS	SURVEY
AGE		
18-24	18.8	17.4
25-34	21.4	23.3
35-44	15.4	16.7
34-54	15.7	14.9
55-64	13.4	13.8
65+	15.3	13.9
SEX		
MALE	47.6	42.7
FEMALE	52.4	57.3
RACE		
WHITE	88.2	89.1
BLACK	10.2	9.1
OTHER	1.6	1.8
AMERICAN INDIAN	.39	1.9*

*THE SURVEY QUESTION ASKED, "ARE EITHER OF YOUR PARENTS OF AMERICAN INDIAN HERITAGE."

TABLE 75

NATIONAL SURVEY 1978 DEMOGRAPHIC INFORMATION COMPARED TO 1977 U.S. CENSUS DATA: OCCUPATION

OCCUPATION*	CENSUS	SURVEY
PROFESSIONALS	15.3	19.6
MANAGERS	10.4	9.7
CLERICAL/SALES	24.5	16.0
CRAFTSMEN	13.1	13.5
OPERATIVES	15.3	11.7
SERVICE WORKERS	13.7	8.1
FARM WROKERS	3.0	3.0
LABORERS	4.7	5.4
UNEMPLOYED	4.6	1.7
STUDENT	6.7	3.7

*OCCUPATIONAL DATA FROM THE CENSUS IS A PERCENT OF TOTAL POPULATION AND INCLUDES PERSON 16 YEARS AND OLDER. THE SURVEY PERCENTAGES ONLY APPLY TO PERSONS 18 YEARS AND OLDER.

TABLE 76

ALASKA SURVEY 1978 DEMOGRAPHIC INFORMATION COMPARED TO U.S. CENSUS DATA: AGE, SEX, RACE

AGE

	CENSUS (1976)	SURVEY
18-24	25.4	22.6
25-34	27.5	32.5
35-44	20.9	22.0
45-54	14.9	12.8
55-65	7.6	7.2
65+	3.7	2.9

RACE

	CENSUS (1976)	SURVEY
WHITE	78.8	73.0
BLACK	3.0	4.0
NATIVE AMERICANS	17.3	18.4
OTHER	.9	4.6

SEX

	CENSUS* (1976)	SURVEY
MALE	52.2	52.0
FEMALE	47.8	48.0

*PERCENT OF TOTAL POPULATION.

TABLE 77

ALASKA SURVEY 1978 DEMOGRAPHIC INFORMATION
COMPARED TO 1976 U.S. CENSUS DATA:
OCCUPATION

OCCUPATION*	CENSUS	SURVEY
PROFESSIONALS	18.1	29.0
MANAGERS	14.6	9.2
CLERICAL/SALES	24.9	10.3
CRAFTSMEN	13.9	12.4
OPERATIVES	9.7	11.8
LABORERS	5.6	11.8
FARM WORKERS	0.7	0.6
SERVICE WORKER	12.5	8.3
UNEMPLOYED	---	0.3
STUDENT	---	2.6
RETIRED	---	0.6
	MISSING	3.1

*OCCUPATIONAL DATA FROM THE CENSUS IS A PRECENT OF TOTAL POPULATION AND INCLUDES PERSONS 16 YEARS AND OLDER. THE SURVEY PERCENTAGES ONLY APPLY TO PERSONS 18 YEARS AND OLDER

APPENDIX IV

FREQUENCY DISTRIBUTION OF PREFERENCES FOR 33 ANIMALS

TABLE 78A

ANIMAL PREFERENCE FREQUENCY DISTRIBUTION

PLEASE INDICATE WHETHER YOU LIKE, DISLIKE OR HAVE NO OPINION ABOUT THE FOLLOWING ANIMALS. WE WOULD LIKE YOUR IMMEDIATE IMPRESSION ONLY. THAT IS, DO YOU STRONGLY LIKE, LIKE, SLIGHTLY LIKE, NEITHER LIKE NOR DISLIKE, SLIGHTLY DISLIKE, DISLIKE, STRONGLY DISLIKE OR HAVE NO OPINION ABOUT A.....

	STRONGLY LIKE	LIKE	SLIGHTLY LIKE	NEITHER LIKE NOR DISLIKE	SLIGHTLY DISLIKE	DISLIKE	STRONGLY DISLIKE	MEAN
VULTURE	(51)	(200)	(191)	(463)	(233)	(714)	(367)	4.91
	2.1	8.1	7.8	18.9	9.5	29.1	14.9	
		18			54			
FROG	(139)	(848)	(546)	(412)	(189)	(201)	(39)	3.18
	5.6	34.6	22.2	16.8	7.7	8.2	1.6	
		62			18			
CAT	(530)	(970)	(382)	(132)	(113)	(206)	(107)	2.74
	21.6	39.5	15.6	5.4	4.6	8.4	4.4	
		77			17			
GORILLA	(146)	(525)	(415)	(543)	(198)	(353)	(131)	3.74
	5.9	21.4	16.9	22.1	8.1	14.4	5.4	
		44			28			
LADYBUG	(391)	(956)	(366)	(367)	(87)	(168)	(39)	2.78
	15.9	38.9	14.9	14.9	3.6	6.9	1.6	
		70			12			
MOOSE	(301)	(965)	(385)	(453)	(70)	(140)	(27)	2.81
	12.2	39.3	15.7	18.4	2.8	5.7	1.1	
		67			10			
RATTLE-SNAKE	(46)	(127)	(114)	(220)	(242)	(726)	(945)	5.66
	1.9	5.2	4.6	9.0	9.9	29.6	38.5	
		12			78			
EAGLE	(677)	(1068)	(280)	(220)	(44)	(85)	(36)	2.29
	27.6	43.5	11.4	9.0	1.8	3.4	1.5	
		83			7			

TABLE 78B

ANIMAL PREFERENCE

	STRONGLY LIKE	LIKE	SLIGHTLY LIKE	NEITHER LIKE NOR DISLIKE	SLIGHTLY DISLIKE	DISLIKE	STRONGLY DISLIKE	MEAN
TROUT	(623)	(1254)	(251)	(205)	(21)	(36)	(7)	2.12
	25.4	51.1	10.2	8.4	0.8	1.5	0.3	
		87			3			
HORSE	(935)	(1234)	(172)	(68)	(9)	(17)	(6)	1.79
	38.1	50.3	7.0	2.8	0.4	0.7	0.3	
		95			1			
COYOTE	(122)	(467)	(348)	(534)	(282)	(453)	(162)	4.02
	5.0	18.6	14.2	21.7	11.5	18.5	6.6	
		38			37			
CROW	(87)	(488)	(331)	(530)	(332)	(458)	(153)	4.06
	3.5	19.9	13.5	21.6	13.5	18.6	6.2	
		37			38			
SALMON	(523)	(1213)	(305)	(263)	(26)	(44)	(12)	2.26
	21.3	49.4	12.4	10.7	1.1	1.8	0.5	
		83			3			
WALRUS	(291)	(848)	(362)	(543)	(63)	(129)	(34)	2.90
	11.9	34.5	14.8	22.1	2.5	5.3	1.4	
		61			9			
BUTTERFLY	(703)	(1230)	(265)	(157)	(19)	(31)	(8)	2.04
	28.6	50.1	10.8	6.4	0.8	1.3	0.3	
		90			2			
DOG	(1234)	(961)	(128)	(59)	(18)	(34)	(11)	1.70
	50.3	39.2	5.2	2.4	0.7	1.4	0.5	
		95			3			
SHARK	(82)	(272)	(209)	(434)	(249)	(662)	(450)	4.82
	3.3	11.1	8.5	17.7	10.1	27.0	18.3	
		23			55			
ELEPHANT	(341)	(1097)	(388)	(384)	(53)	(89)	(36)	2.63
	13.9	44.7	15.8	15.6	2.2	3.6	1.5	
		74			7			

TABLE 78C
ANIMAL PREFERENCE

	STRONGLY LIKE	LIKE	SLIGHTLY LIKE	NEITHER LIKE NOR DISLIKE	SLIGHTLY DISLIKE	DISLIKE	STRONGLY DISLIKE	MEAN
WASP	(34) 1.4	(107) 4.4	(100) 4.1	(205) 8.3	(277) 11.3	(865) 35.2	(823) 33.5	5.68
		10			80			
TURTLE	(260) 10.6	(1130) 46.0	(453) 18.5	(364) 14.8	(65) 2.6	(102) 4.2	(28) 1.2	2.69
		75			8			
WOLF	(186) 7.6	(521) 21.2	(315) 12.8	(429) 17.5	(222) 9.0	(491) 20.0	(224) 9.1	3.98
		42			38			
RAT	(17) 0.7	(49) 2.0	(56) 2.3	(78) 3.2	(136) 5.6	(710) 28.9	(1380) 56.2	6.26
		5			91			
ROBIN	(716) 29.2	(1336) 54.4	(211) 8.6	(104) 4.2	(10) 0.4	(28) 1.2	(25) 1.0	1.99
		92			3			
MOSQUITO	(14) 0.6	(30) 1.2	(29) 1.2	(90) 3.6	(168) 6.8	(823) 33.5	(1272) 51.8	6.27
		3			92			
WHALE	(327) 13.3	(938) 38.2	(325) 13.2	(484) 19.7	(58) 2.4	(148) 6.0	(67) 2.7	2.88
		65			11			
COCK-ROACH	(15) 0.6	(26) 1.1	(24) 1.0	(65) 2.7	(97) 3.9	(640) 26.1	(1564) 63.7	6.45
		3			94			
RACCOON	(339) 13.8	(1029) 41.9	(398) 16.2	(347) 14.1	(73) 3.0	(145) 5.9	(72) 2.9	2.80
		72			12			
LIZARD	(117) 4.8	(520) 21.2	(318) 13.0	(470) 19.1	(210) 8.6	(451) 18.4	(306) 12.5	4.13
		39			40			

TABLE 78D

ANIMAL PREFERENCE

	STRONGLY LIKE	LIKE	SLIGHTLY LIKE	NEITHER LIKE NOR DISLIKE	SLIGHTLY DISLIKE	DISLIKE	STRONGLY DISLIKE	MEAN
OWL	(361)	(1117)	(398)	(313)	(47)	(125)	(59)	2.66
	14.7	45.5	16.2	12.7	1.9	5.1	2.4	
		76			9			
SKUNK	(115)	(465)	(285)	(363)	(230)	(525)	(426)	4.42
	4.7	18.9	11.6	14.8	9.4	21.4	17.4	
		35			48			
BEAR	(313)	(923)	(423)	(393)	(96)	(183)	(87)	2.97
	12.8	37.6	17.2	16.0	3.9	7.5	3.5	
		68			15			
BAT	(58)	(193)	(145)	(263)	(254)	(779)	(710)	5.35
	2.4	7.9	5.9	10.7	10.3	31.7	28.9	
		16			71			
SWAN	(754)	(1267)	(221)	(134)	(12)	(22)	(13)	1.97
	30.7	51.6	9.0	5.5	0.5	0.9	0.5	
		91			2			

APPENDIX V

ATTITUDE SCALE MEAN SCORES BY SELECTED ANIMAL-RELATED ACTIVITY GROUPS

FIGURE 39

NATURALISTIC SCALE MEANS BY SELECTED ANIMAL ACTIVITY GROUPS

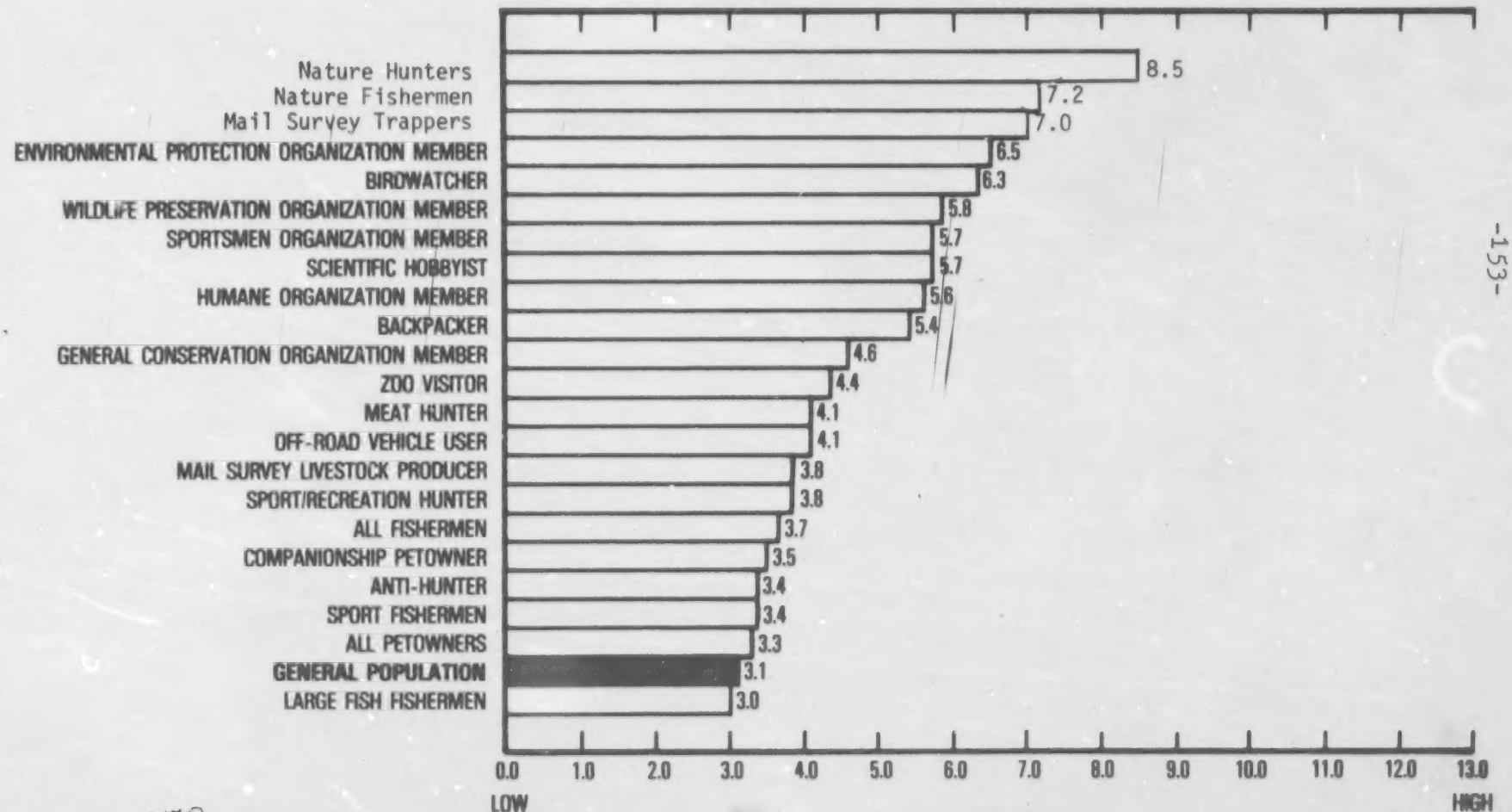


FIGURE 40

ECOLOGISTIC SCALE MEANS BY SELECTED ANIMAL ACTIVITY GROUPS

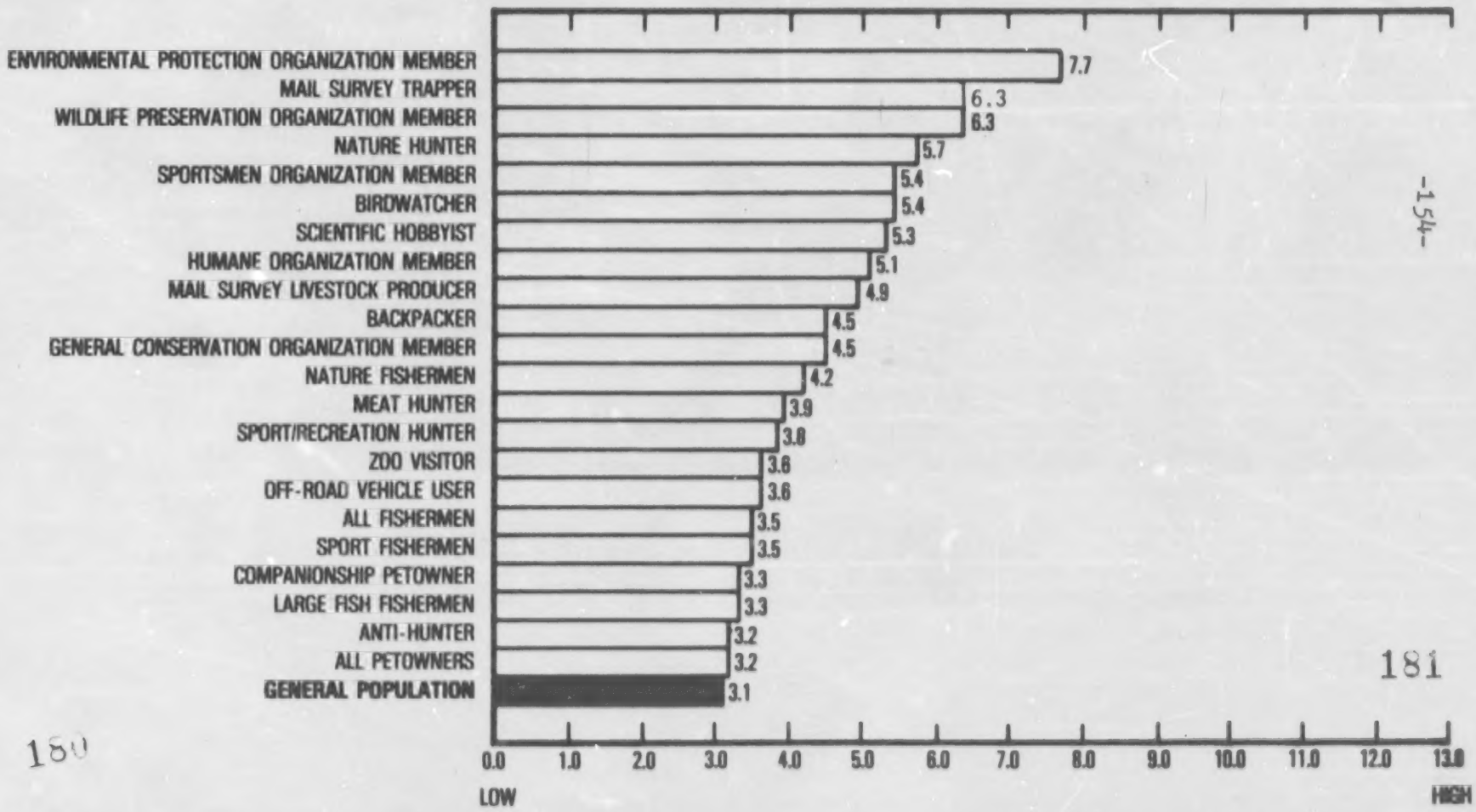


FIGURE 41

HUMANISTIC SCALE MEANS BY SELECTED ANIMAL ACTIVITY GROUPS

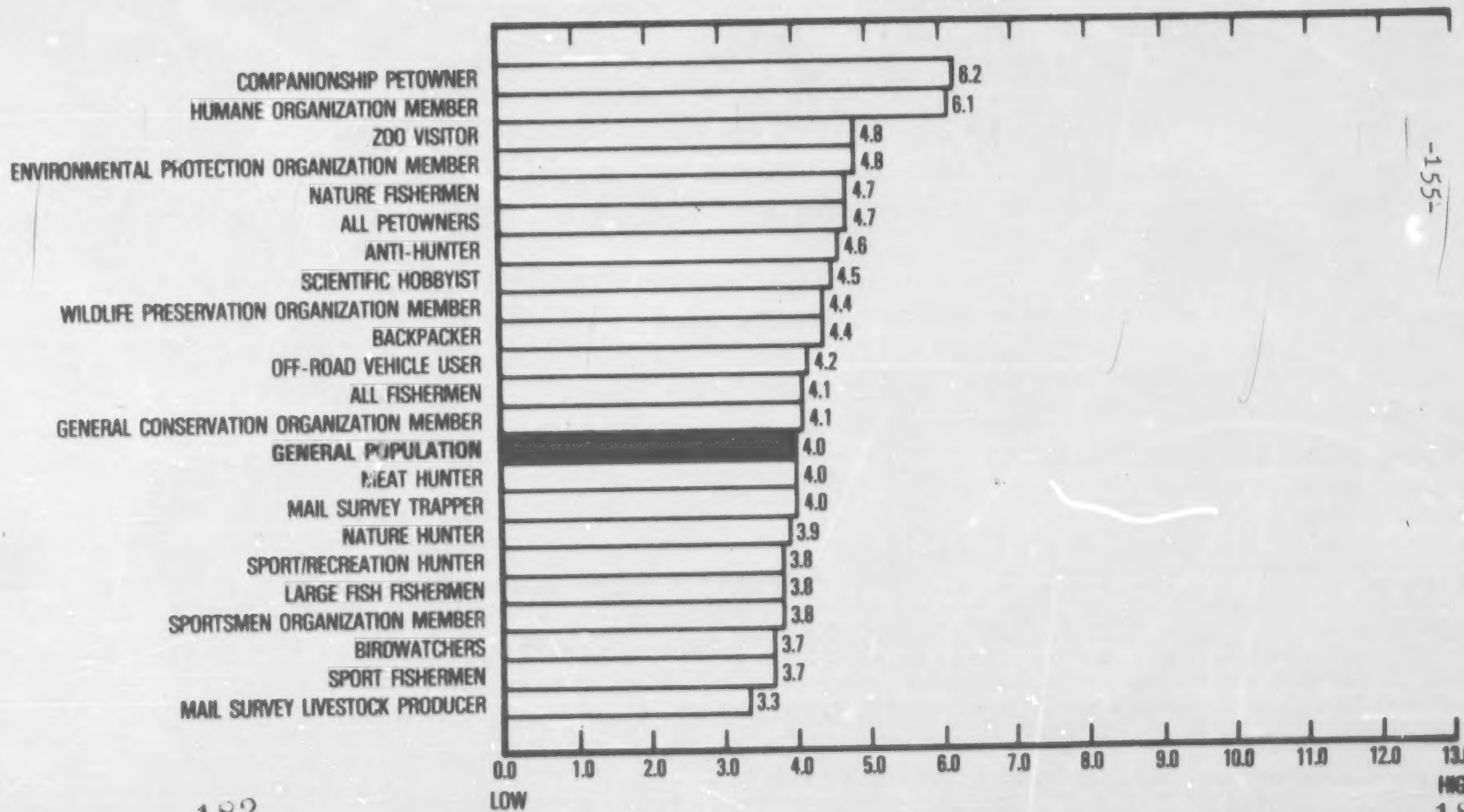


FIGURE 42

MORALISTIC SCALE MEANS BY SELECTED ANIMAL ACTIVITY GROUPS

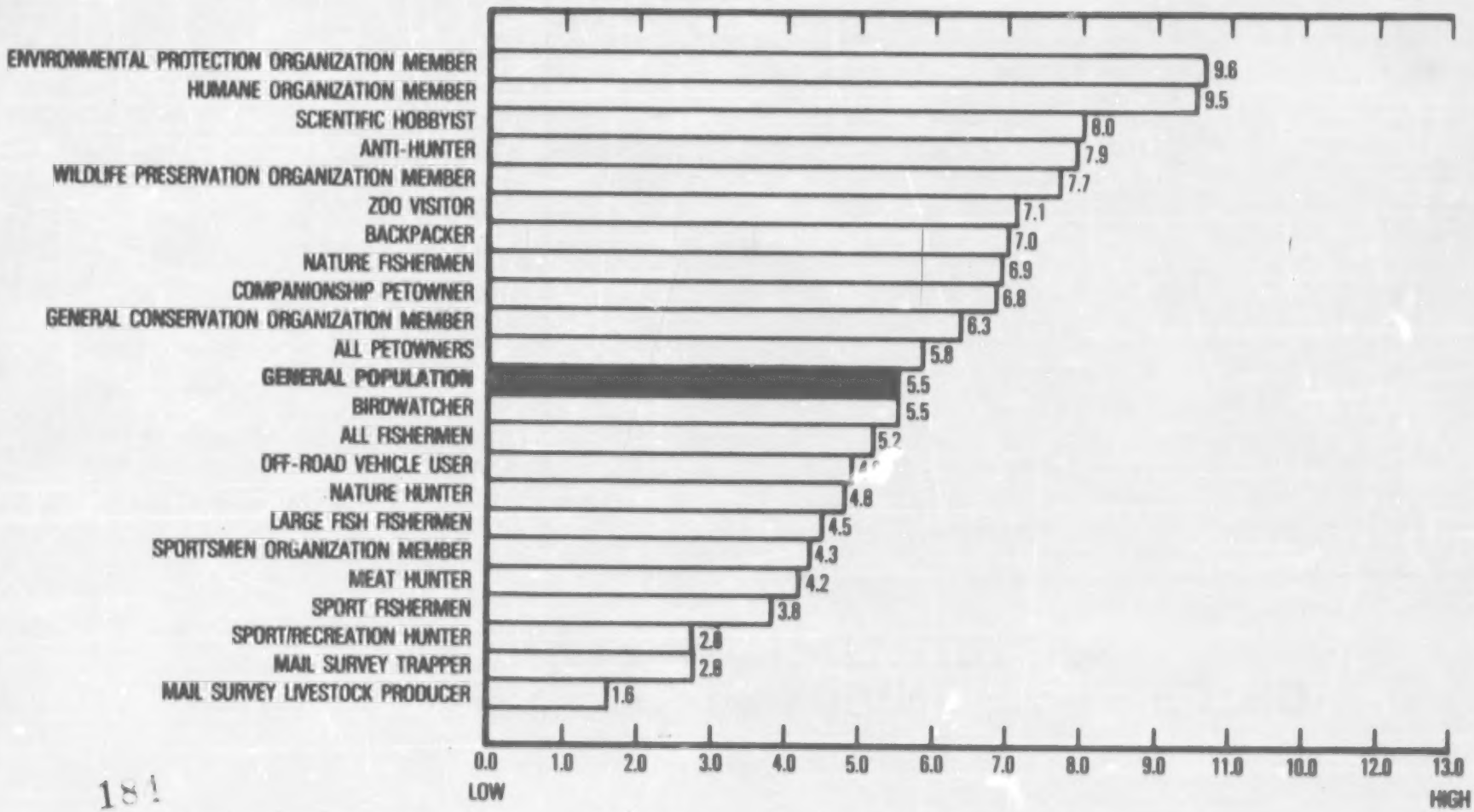


FIGURE 43

SCIENTISTIC SCALE MEANS BY SELECTED ANIMAL ACTIVITY GROUPS

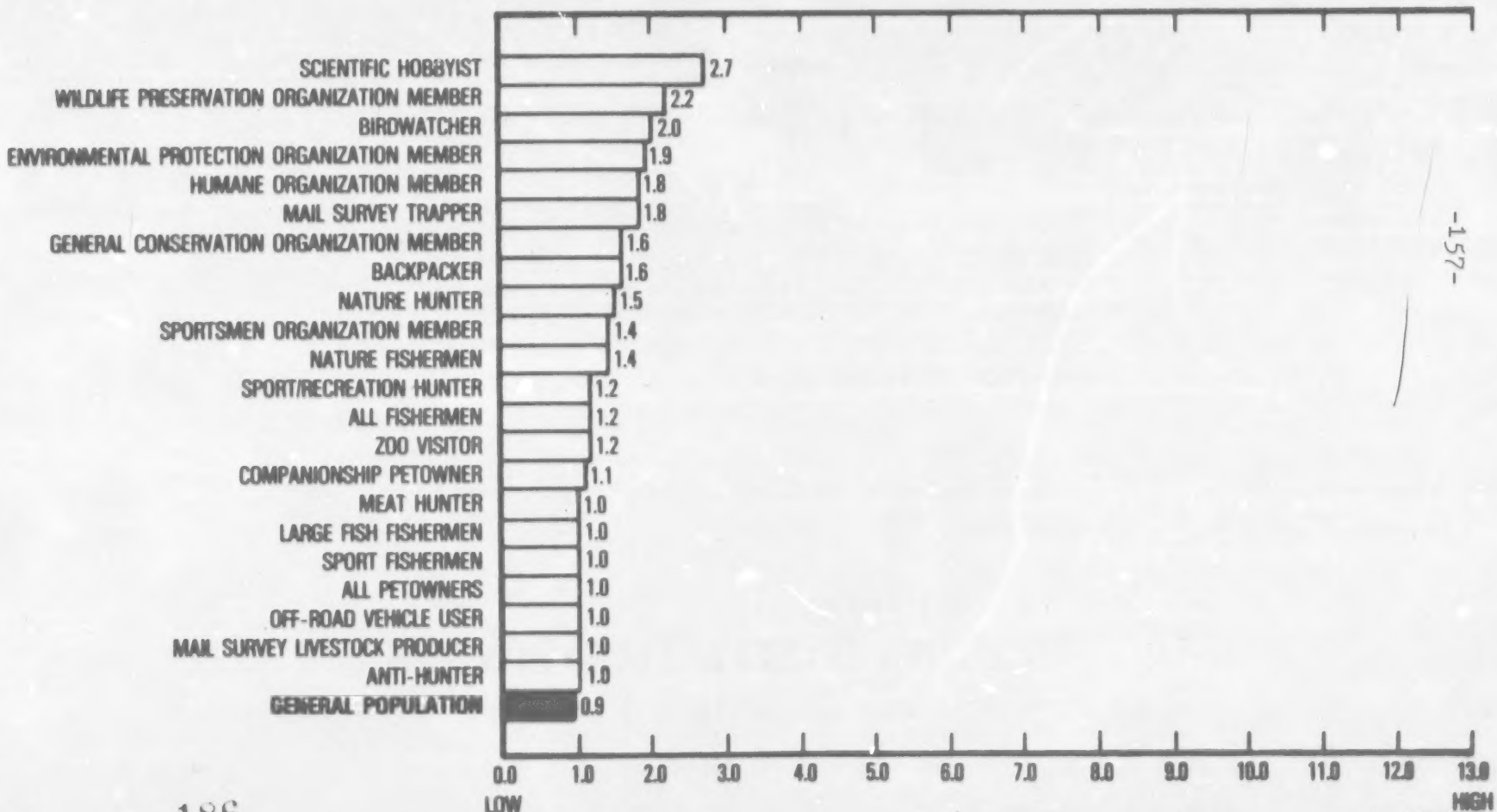


FIGURE 44

UTILITARIAN SCALE MEANS BY SELECTED ANIMAL ACTIVITY GROUPS

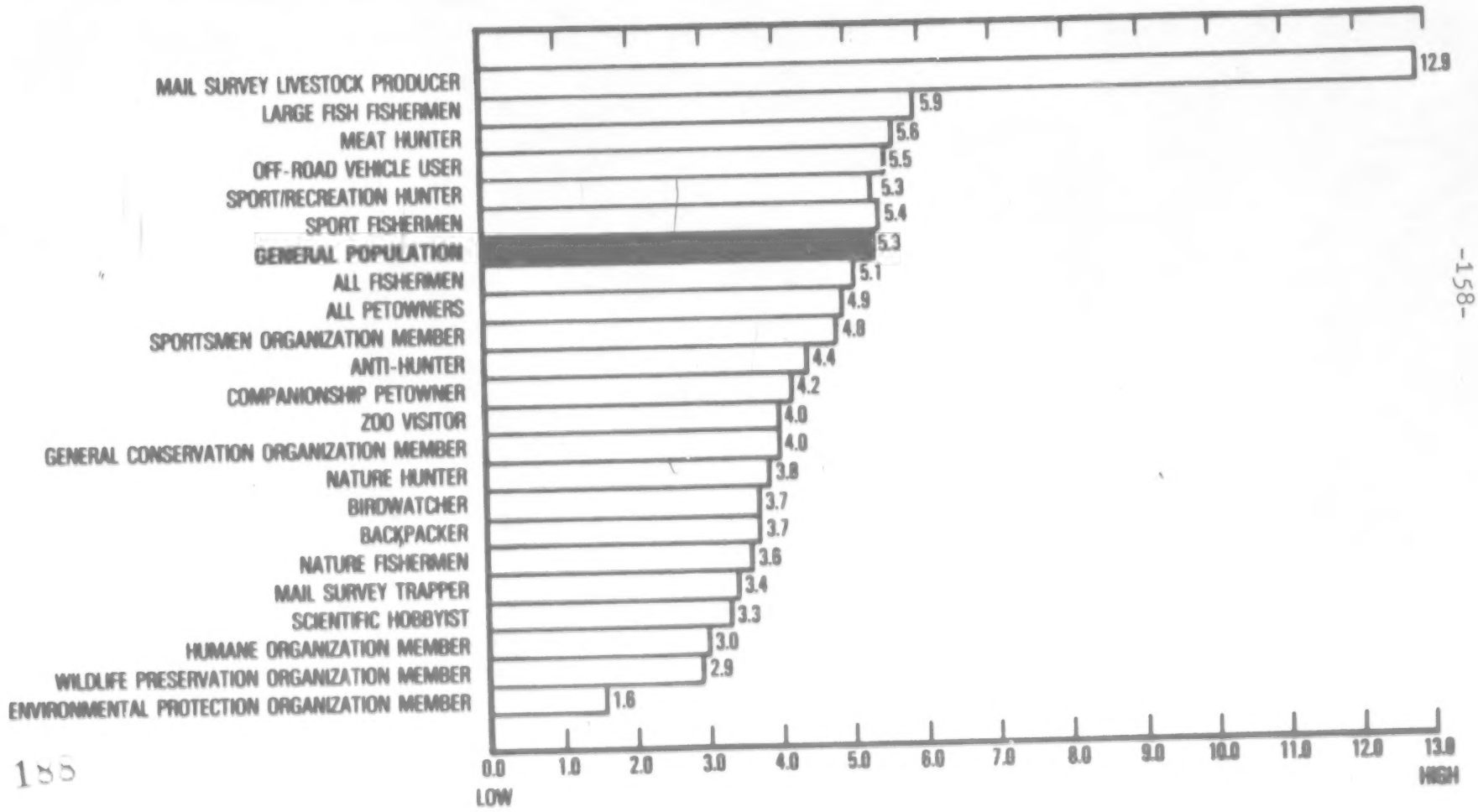


FIGURE 45

DOMINIONISTIC SCALE MEANS BY SELECTED ANIMAL ACTIVITY GROUPS

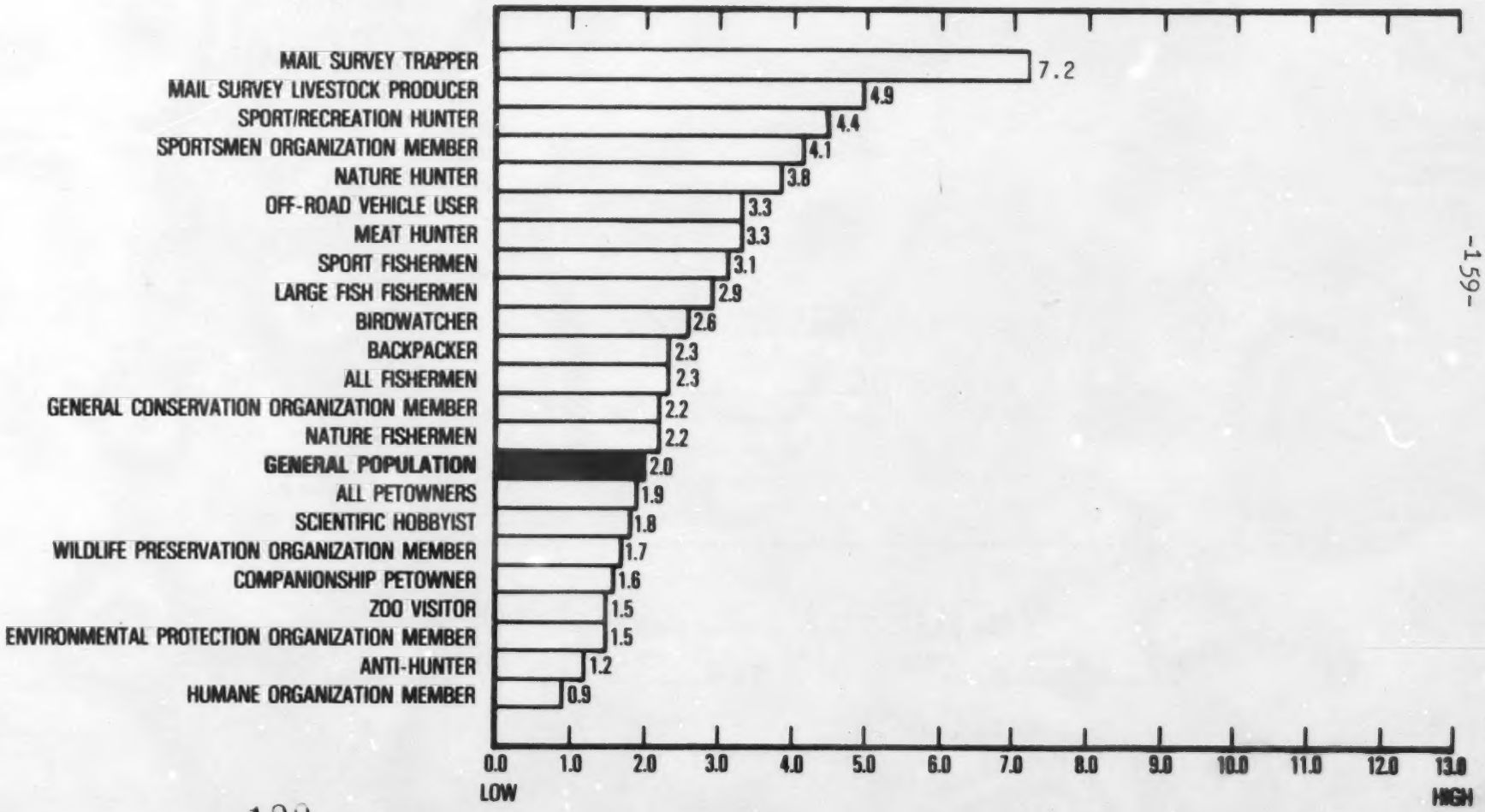
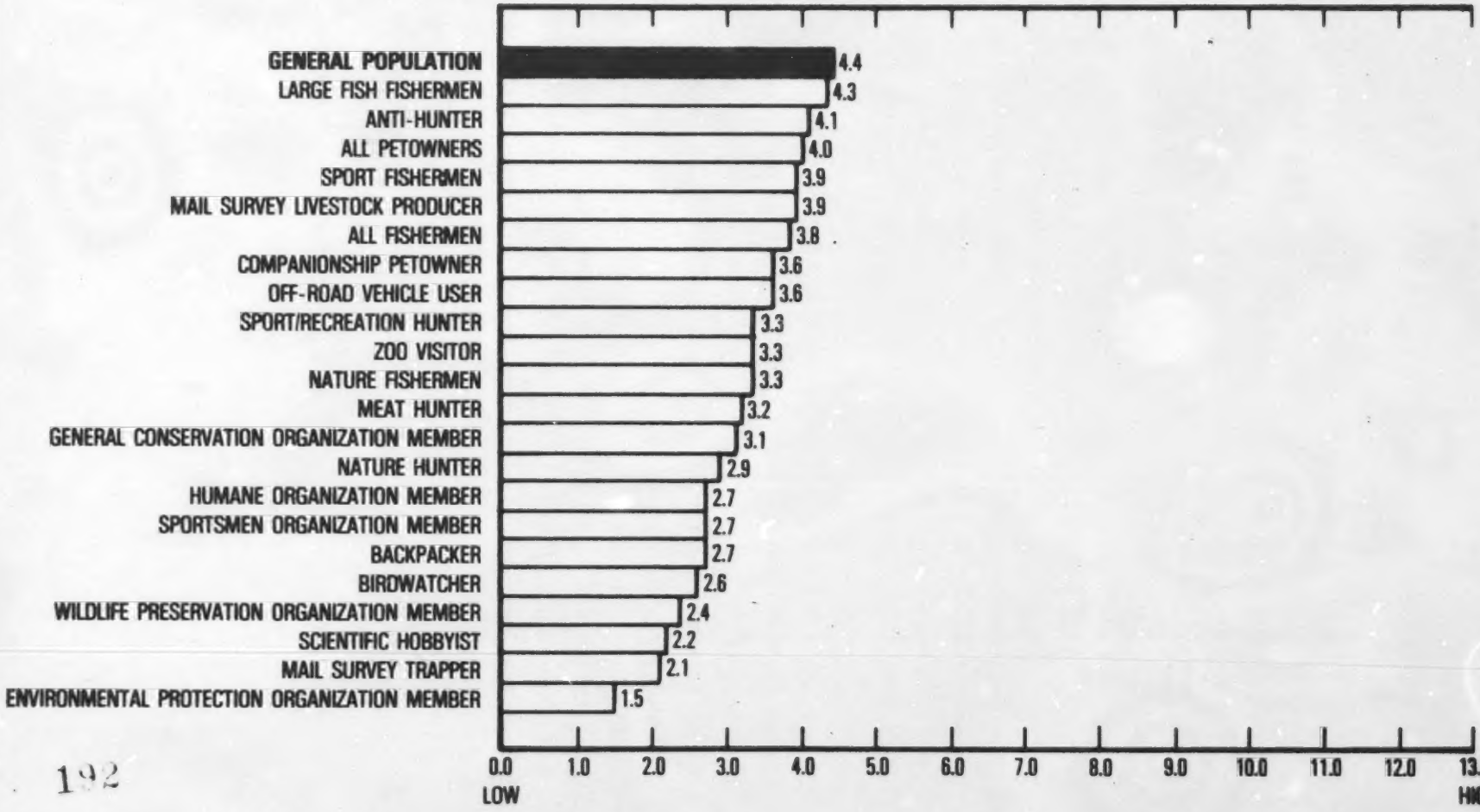


FIGURE 46

NEGATIVISTIC SCALE MEANS BY SELECTED ANIMAL ACTIVITY GROUPS



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Footnotes

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